

# NAVAL POSTGRADUATE SCHOOL

## Monterey, California



**THESIS**

**DTIC**  
**ELECTE**  
**MAR 14 1995**  
**S G D**

**TECHNICAL DATA RIGHTS IN  
A CALS ENVIRONMENT**

by

Robert K. Carter

December, 1994

Principal Advisor:

Mark W. Stone

Approved for public release; distribution is unlimited.

19950306 107

DTIC QUALITY INSPECTED 1

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704	
<p>Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.</p>				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE December 1994		3. REPORT TYPE AND DATES COVERED Master's Thesis
4. TITLE AND SUBTITLE Technical Data Rights in a CALS Environment			5. FUNDING NUMBERS	
6. AUTHOR(S) Robert K. Carter				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE	
<p>13. ABSTRACT (maximum 200 words)</p> <p>DOD weapon system and commodity managers currently are seeking to implement large scale automated procurement and information systems for sharing databases between DOD and various contractor and subcontractor activities. A prevalent shared database system is the Continuous Acquisition and Life-Cycle Support (CALS) system and the associated Joint Continuous Acquisition and Life-Cycle Support (JCALS) system for major weapon system procurement. An important issue for the manager of any integrated, shared database is the protection of technical data rights for the information contained in the database.</p> <p>This study, through the use of personal interviews and surveys, determined that the existing dichotomy between the Government and industry concerning technical data rights protection can be bridged through standardization of the CALS program, simplification and clarification of governing policies and guidelines, and better use of inputs from system users.</p>				
14. SUBJECT TERMS Technical data Automated procurement Continuous Acquisition and Life-Cycle Support (CALS)			15. NUMBER OF PAGES 112	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UL	

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)

Prescribed by ANSI Std. Z39-18



Approved for public release; distribution is unlimited.

TECHNICAL DATA RIGHTS IN  
A CALS ENVIRONMENT

by

Robert K. Carter  
Lieutenant Commander, United States Navy  
B.S., Indiana University, 1980

Submitted in partial fulfillment  
of the requirements for the degree of

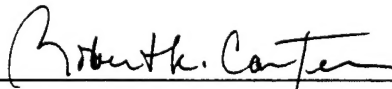
MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL  
December 1994

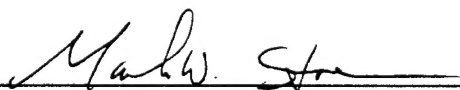
Accession For	
NTIS CRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification _____	
By _____	
Distribution / _____	
Availability Codes	
Dist	Avail and/or Special
A-1	

Author:

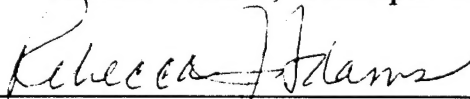


Robert K. Carter

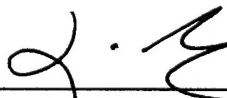
Approved by:



Mark W. Stone, Principal Advisor



Rebecca J. Adams, Associate Advisor



David R. Whipple, Chairman  
Department of  
Systems Management



## **ABSTRACT**

DOD weapon system and commodity managers currently are seeking to implement large scale automated procurement and information systems for sharing databases between DOD and contractor various contractor and subcontractor activities. A prevalent shared database system is the Continuous Acquisition and Life-Cycle Support (CALs) system and the associated Joint Continuous Acquisition and Life-Cycle Support (JCALS) system for major weapon system procurement. An important issue for the manager of any integrated, shared database is the protection of technical data rights for the information contained in the database.

This study, through the use of personal interviews and surveys, determined that the existing dichotomy between the Government and industry concerning technical data protection can be bridged through standardization of the CALs program, simplification and clarification of governing policies and guidelines, and better use of inputs from system users.

## TABLE OF CONTENTS

I.	INTRODUCTION AND BACKGROUND . . . . .	1
A.	RESEARCH OBJECTIVE . . . . .	1
B.	RESEARCH QUESTIONS . . . . .	2
C.	SCOPE, LIMITATIONS, AND ASSUMPTIONS . . . . .	2
	1. Scope . . . . .	2
	2. Limitations . . . . .	2
	3. Assumptions . . . . .	3
D.	ORGANIZATION OF STUDY . . . . .	4
E.	METHODOLOGY OF RESEARCH GATHERING . . . . .	4
II.	BACKGROUND . . . . .	7
A.	INTRODUCTION . . . . .	7
B.	CALS BACKGROUND . . . . .	7
	1. Data Rights Categories . . . . .	10
	2. Policies . . . . .	12
	a. Current Government . . . . .	12
	b. Current Industry . . . . .	14
	c. Proposed . . . . .	15
	(1) Allocating Data Rights. . . . .	15
	(2) Defining Developed Data. . . . .	16
	(3) Indirect Costs. . . . .	17
	(4) Mixed Funding Situations. . . . .	18
	(5) Commercial Items. . . . .	20
	(6) Copyrights. . . . .	20
	3. Procedure . . . . .	21
	4. Application . . . . .	23
III.	DATA PRESENTATION . . . . .	25
A.	INTRODUCTION . . . . .	25
B.	SURVEY . . . . .	25
C.	RESTRICTIONS AND ORIGINS . . . . .	26
D.	SHARED DATABASE IN THE MARKETPLACE . . . . .	28

E.	PROTECTIVE ACTIONS . . . . .	30
1.	FAR and DFARS Clauses . . . . .	30
2.	Copyrights and Patents . . . . .	31
F.	GOVERNMENT TECHNICAL DATA ACQUISITION . . . . .	33
G.	CALS AND TECHNICAL DATA RIGHTS . . . . .	35
1.	CITIS . . . . .	36
2.	GCO . . . . .	37
3.	CALSIP . . . . .	38
4.	Technical Data Management and Standards . . . . .	38
a.	Technical Data Management . . . . .	38
b.	Technical Data Standards . . . . .	39
5.	Technical Data Security . . . . .	40
6.	Incentives and Benefits . . . . .	41
H.	SUMMARY . . . . .	42
IV.	DATA ANALYSIS . . . . .	43
A.	INTRODUCTION . . . . .	43
B.	RESTRICTIONS AND ORIGINS OF TECHNICAL DATA . . . . .	43
C.	SHARED DATABASE IN THE MARKETPLACE . . . . .	45
D.	PROTECTIVE ACTIONS . . . . .	46
1.	FAR and DFARS Clauses . . . . .	46
2.	Copyrights, Patents, and Trade Secrets . . . . .	48
E.	GOVERNMENTAL TECHNICAL DATA ACQUISITION . . . . .	49
F.	CALS AND TECHNICAL DATA RIGHTS . . . . .	54
G.	PROPOSED REGULATION CHANGES . . . . .	55
1.	Allocating Data Rights . . . . .	56
2.	Defining "Developed Data" . . . . .	57
3.	Expenses and Indirect Costs . . . . .	59
4.	Mixed Funding Situations . . . . .	61
5.	Commercial Items . . . . .	62
6.	Copyrights, Patents and Trade Secrets . . . . .	64
7.	Data Repositories . . . . .	65
8.	Proposed Regulation Changes . . . . .	66
H.	SUMMARY . . . . .	69

V. CONCLUSIONS AND RECOMMENDATIONS . . . . .	73
A. CONCLUSIONS . . . . .	73
1. Subsidiary Research Questions . . . . .	73
2. Generalized Overview . . . . .	78
B. RECOMMENDATIONS . . . . .	78
1. Research Questions . . . . .	78
2. Summary . . . . .	84
C. RECOMMENDATIONS FOR FURTHER RESEARCH . . . . .	84
APPENDIX A. GLOSSARY OF TERMS . . . . .	87
APPENDIX B. PRELIMINARY SURVEY (CONTRACTOR) . . . . .	89
APPENDIX C. PRELIMINARY SURVEY (GOVERNMENT) . . . . .	91
APPENDIX D. FINAL SURVEY (CONTRACTOR) . . . . .	93
APPENDIX E. FINAL SURVEY (GOVERNMENT) . . . . .	95
APPENDIX F. MANAGEMENT ORGANIZATION OF CALS . . . . .	97
LIST OF REFERENCES . . . . .	99
INITIAL DISTRIBUTION LIST . . . . .	103

## **I. INTRODUCTION AND BACKGROUND**

### **A. RESEARCH OBJECTIVE**

The Department of Defense (DOD) weapon system and commodity managers currently are attempting to implement large scale automated procurement and information systems for sharing databases between DOD and various contractor and subcontractor activities. A prevalent shared database system is the Continuous Acquisition and Life-Cycle Support (CALs) system for major weapon system procurement. An important issue facing the manager of any integrated, shared database is the protection of technical data rights for the information contained in the database. The procedure of sharing access to a large volume of technical data by both DOD and industry is complicated and could lead to a compromise of Government and industry data rights.

The Federal Acquisition Regulation (FAR) and its Defense Acquisition Regulation Supplement (DFARS) recently have added detailed revisions to provide guidance for the protection of technical data rights for both the Government and industry activities. There are conflicting interpretations of this guidance, however, by both industry and the Government. Consequently, there is a dichotomy of understanding in the technical data protection arena. These conflicts and misunderstandings, along with several other obstacles which are discussed later in this thesis result in delays in the implementation of the CALs and the Joint Continuous Acquisition and Life-Cycle Support (JCALS) programs.

This thesis analyzes these areas to identify where changes in technical data rights might be required to successfully implement and utilize the CALs program.

## **B. RESEARCH QUESTIONS**

The primary research question is as follows:

What action(s) must be taken by industry and the Government to allow both access to technical data and protection of proprietary technical data in the CALS environment?

The following are the subsidiary research questions:

(1) What is the impact of contractor restrictions on the Government's right to use and distribute technical data?

(2) What is the impact of Government restrictions on the contractor's right to use, distribute, and own technical data?

(3) What are the existing industry and Government shared data base contractual agreements for the delivery, retrieval, dissemination, and use of technical data?

(4) What are the current methods for protecting restricted technical data in existing industry and Government shared automated information systems used by the DOD? What are the proposed methods for protecting restricted technical data in the CALS environment?

## **C. SCOPE, LIMITATIONS, AND ASSUMPTIONS**

### **1. Scope**

The scope of this thesis is restricted to examining technical data rights issues existent between DOD and industry. Since many DOD activities have not yet implemented CALS, this thesis focuses on activities that deal with CALS or a shared database computer system.

### **2. Limitations**

Although DFARS 252.227-7013 (a) (18) includes computer software in the definition of "technical data," both the DFARS and FAR treat computer software separately through separate clauses. For the purposes of this thesis, the uses of computer software rights are not analyzed.

Also, the area of the treatment of technical data rights in international transactions are not discussed in this thesis.

A total of twelve individuals from various departments of seven defense contractors and Government buying activities were part of the final survey process. It is believed that this number is sufficient to achieve adequate findings establishing a baseline of data to apply to defense contractors as a whole. The lack of historical information due to a lack of previous research in this area and the short amount of time that CALS has been operational also limits the scope of this thesis.

Currently, there are revisions of DFARS clause 252.227-7013, "Rights in Technical Data and Computer Software," and DFARS clause 227.4, "Rights in Data and Copyrights," pending public comment and approval from the Under Secretary of Defense for Acquisition and Technology (USD (A&T)). At the time of the completion of this thesis, the revisions were not finalized. This thesis utilizes the FAR and DFARS regulations dated April 1984.

The proposed regulation changes are discussed in Chapter II. Possible ramifications of changes in the existing regulations are analyzed in Chapter III of this thesis.

### **3. Assumptions**

Although this thesis contains explanations and definitions of topic-specific words and concepts, it is written and worded with the assumption that the reader has a basic working knowledge of the procurement process and of its jargon. A complete listing of these topic-specific terms are included as Appendix A: Glossary of Terms.

#### **D. ORGANIZATION OF STUDY**

The remaining portions of this research are organized by providing the inputs gathered from the respondents of the interview followed by an analysis of the data, not only in the context of the surveys, but in terms of the existing DOD regulations and policies governing technical data rights. A conclusion and recommendation section follows.

#### **E. METHODOLOGY OF RESEARCH GATHERING**

Information used in this thesis was obtained primarily through three methods: literature search, telephone conversations, and written survey.

In addition to periodical index guides and various library catalogs, extensive use of the Defense Logistics Studies Information Exchange (DLSIE) and the Defense Technical Information Center (DTIC) was made. Relevant books, articles, and other documents are cited in the List of References.

Over forty telephone conversations were conducted during the course of gathering information. These conversations were with Government executive agencies, Government purchasing agencies, private contracting firms, and task groups. Many of the initial conversations were used to determine the activity's exposure to technical data rights issues and the CALS program. This familiarity was established through the use of preliminary surveys (Appendices B and C). These responses were then used to construct a final version of the surveys (Appendices D and E) which were issued. A balance between Government-based and company-based questions was sought. While the literature search gave the researcher a strong indication of the theories and technical aspects of the subject matter, the telephone conversations and surveys provided details of how these areas were dealt with in real life. Based on the



information received from the literature review and the conversations and surveys, it could be concluded that there is a need to reduce the dichotomy of understanding that exists between industry and the Government concerning technical data rights in a shared database environment. The resultant task is then seen to define this dichotomy, examine the current restrictions used by industry and the Government, and identify the procedures which could be used to satisfy the requirements of both interested parties.



## II. BACKGROUND

### A. INTRODUCTION

To best understand the current importance and future impact of technical data and technical data rights, it is best to review the general, historical background of CALS leading to some of the current regulations, policies, and attitudes.

An explanation of the categories of Government data rights will be defined, followed by a discussion of both the present Government regulations and policies and the proposed regulation revisions. Next, the procedure used by the Government to determine the technical data required for an acquisition will be presented. To conclude this section, a discussion of how this thesis can be applied in a work environment will be included.

### B. CALS BACKGROUND

In the mid-1980's, a perceived need to reduce weapon system design time and documentation costs within the Department of Defense evolved into the Continuous Acquisition Life-Cycle Support (CALS) initiative. This initiative sought to address the integration and use of digitized technical data for weapon system engineering, manufacturing, and logistics. The CALS initiative is a technology that will enable digital technical data to more effectively and efficiently support the acquisition of weapon systems. A key element of this initiative is to provide common data interchange standards by DOD and industry so that every computer operating system can be used and compatibility between the Government and industry computer languages is achieved. [Ref.1, p.1-3]

According to the "CALS Architecture Study," the sheer volume of technical information is mindboggling. The study states that nearly one *billion* aperture cards containing

technical data on spare parts for weapon systems, and approximately one million different technical manuals consisting of hundreds of pages of text and illustrations require annual updates of millions of pages. The weapon systems manuals onboard a Ticonderoga-class Navy cruiser weigh 26 tons. [Ref.2, p.3] A goal of CALS is to digitize virtually all technical information and drawings for defense equipment and to develop the ability for the Government and industry computers to share those data.

[Ref.2, p.3]

There have been several realignments of organizational relationships for CALS. Originally, CALS was placed under the office of the Assistant Secretary of Defense (Production and Logistics) (ASD (P&L)). After three realignments of the CALS organization, CALS is now under the Office of the Under Secretary of Defense (Acquisition and Technology)/CALS (OUSD (A&T)/CALS). (See Appendix F) The CALS management structure also includes various DOD components. Each of the Military Departments and the Defense Logistics Agency (DLA) have established a CALS office to coordinate the efforts in their respective organizations. [Ref.3, p.4-5] The CALS initiative involves three areas: 1) weapon systems acquisition, 2) information systems, and 3) contract support. The Defense Acquisition Board (DAB) analyzes CALS requirements for weapon system requirements. The scope of this analysis includes the contractors' technical information systems and processes, delivery of the technical data in a digital format, and Government access to contractor data. The Major Automated Information System Review Council reviews CALS requirements for automated information systems. Areas that are analyzed include data interchange and access requirements, and acquisition of computer hardware and software. In the realm of contract support, there are approximately 128 weapon systems

acquisition programs and 62 contractors using CALS technology. [Ref.3, p.8]

The joint CALS (JCALS) system is designed to implement joint-Service functional requirements for digital data. JCALS also provides the infrastructure required to acquire, process, and distribute technical data in support of weapon systems. It is imperative for JCALS to provide a good communications network between OUSD (A&T)/CALS, the Service component CALS offices, and the weapon system program managers to allow database connectivity between each weapon system. The scope of JCALS has recently been expanded. In 1994, the Office of the Assistant Secretary of Defense (Procurement & Logistics) (OASD (P&L)) designated JCALS as being the lead program for developing and implementing CALS capabilities, including the Integrated Weapon System Database (IWSDB), throughout DOD. The Army acts as the lead Service for JCALS. [Ref.3, p.14]

During the 1980's, the need to comply with statutory competition requirements and public criticism of DOD spare parts pricing practices prompted DOD to demand greater amounts of technical data from its contractors and require the contractors to provide the data without restrictions on the Government's rights to use, release, or disclose the data. Several military department data requirements policies raised concerns among industry, particularly toward DOD demands that developers of data deliver unlimited rights in privately developed items to permit other manufacturers to compete in the areas of additional items or spare parts. [Ref.4, p.3-4] To increase Governmental control, Congress enacted a series of technical data statutes and the President issued Executive Order number 12591 in April 1987 requiring various executive agencies to formulate a uniform data rights policy giving contractors data ownership under Federal contracts except when the Government specifically

purchases the data as part of the contract. [Ref.4, p.4]

### **1. Data Rights Categories**

Government Purpose License Rights (GPLR) is a new category of technical data established by a revision of DFARS 252.227-7013 (Rights in Technical Data and Computer Software) in May 1987. According to DFARS 252.227-7013, the other existing categories of DOD rights in technical data delivered under contract are: 1) unlimited rights, giving DOD the right to use, duplicate, or disclose the technical data in any way, for any purpose, to anyone, or to the whole world; and 2) limited rights, giving DOD the right to use the data for internal Government purposes only. DFARS 252.227-7013 (a)(15)(i) states that DOD may not disseminate or expose limited rights data outside the Government without the written permission of the contractor or the subcontractor that created the data except, a) when needed for emergency repair and overhaul, or b) for limited use by foreign governments for evaluation or information.

The GPLR category recognizes scenarios where both the contractor and Government contribute funds to develop the data item or the process that the data describes (mixed funding scenarios). As per the initial wording of the clause, data rights were then allocated according to the money contributed by each party for data development via the "50% Rule." The "50% Rule" is best described by example. If a contractor's percentage of contribution (POC) was 50% or less, the Government would receive unlimited rights. If the contractor's POC was between 51% and 99%, the Government would receive GPLR. If the contractor's POC was 100%, the Government would receive limited rights. [Ref.4, p.5]

The benefits received by the Government from GPLR rights are that the Government may disclose or provide GPLR data to a third party that has executed the Standard Non-Disclosure Agreement. This agreement establishes a third

party status for the contractor identified in the GPLR legend. The Government and the third party may only use the data for Government purposes only. These Government purposes would be any activity in which the United States Government is a party, including cooperative agreements with international or multi-national defense organizations, or sales or transfers by the United States Government to foreign governments or international organizations. Government purposes include competitive procurement, but do not include the rights to use, modify, reproduce, release, perform, display, or disclose technical data for commercial purposes or authorize others to do so. [Ref.4, p.2] Therefore, the Government gets to use the data for Government purposes without having to spend the extra money for unlimited rights. The company gets to maintain rights to the data that might otherwise be procured by the Government, plus they may have a designated time in which they have exclusive commercial rights for the data as well.

According to DFARS 227.403-70 (6)(c)(3), these time limits may be expressed in the contract and should normally be no less than one year nor more than five years after the estimated date of first production delivery to the Government to which the technical data pertains. These time limits may be increased by mutual agreement.

Technical data having a rights restriction category of other than unlimited shall not be released to sources outside the Government unless the data release is subject to disclosure prohibition. If the data are subject to GPLR rights, the contractor must sign a non-disclosure agreement form. Therefore, in accordance with DFARS 227.403-70 (d)(3), the data will be used only for Government purposes.

## **2. Policies**

### **a. Current Government**

There are many factors involved in the acquisition of technical data. These include design complexity and stability, expected inventory life of the system, and cost.

Ordering technical data from contractors is very expensive. The decision to procure data should be made only after carefully deciding whether the potential benefits are more than the cost of the data itself. [Ref.6] It is DOD's general policy to obtain only the minimum essential data needed. As DFARS 222.402-71 states: "The Department of Defense shall obtain only the minimum essential technical data and data rights." DOD Instruction (DODI) 5000.2 states:

Only the minimum data needed to permit cost-effective support of research, development, provisioning, training, operation, maintenance, and related logistics functions over the life cycle of the item will be acquired.

In real-life application, this policy is often challenged because of the common confusion over the need for technical data and with the desire for technical data. In this context, "need" is typically defined as the minimum technical data that are required to meet a requirement, whereas "desire" is usually defined as the maximum technical data available for a requirement. [Ref.6] DOD will frequently acquire technical data to fill its needs with little regard to cost. Many representatives of private industry are concerned however, that the Government seeks ownership of technical data based on desires instead of needs. [Ref.6,7,8]

As discussed later in this thesis, this concern is critical in a shared database environment such as CALS due to industry beliefs that Government ownership and control of technical data causes possible retardation of



commercialization and product or service differentiation.

[Ref.7, 9]

The DFARS' Rights in Technical Data and Computer Software clause was revised again in April 1988 and called for DOD to drop the "50% Rule" in favor of individual case negotiations. [Ref.4, p.6] Although the need to be able to demonstrate that technical data developed at private expense still exists, this new policy greatly increases the promotion of commercialization of technology by allowing the data developers to claim GPLR and commercialization rights in a greater number of cases. GPLR is a negotiated factor that can be awarded irrespective of the contractor's POC. [Ref.4, p.7]

On 28 October 1988, the Defense Acquisition Regulatory Council (DARC) published a revision of the April 1988 rule. [Ref.4, p.8] A summary of the changes are:

- 1) The revision makes a clearer statement regarding the Government's policy on protecting technical data pertaining to privately developed commercial items. It is not the Government's policy to obtain technical data rights or technical data for competitive acquisition of privately developed commercial items. [Ref.4, p.8]
- 2) The process of establishing rights in data have been clarified and simplified. The listing of privately funded technical data does not accelerate the validation of the data and is not a final determination of rights. Also, the former provisions included in DFARS 252.227-7035 (Preaward Notification) and 252.227-7038 (Listing and Certification of Development of Technology with Private Funding) have merged into the basic data rights clause- DFARS 252.227-7013. [Ref.4, p.9]
- 3) There is additional emphasis on the responsibility of prime contractors to recognize and protect their subcontractors' data rights, while satisfying their contracts with the Government. [Ref.4, p.9]
- 4) A revision of the definition of "required as an element of performance under a Government contract

or subcontract" was to include only development that was both accomplished during, and necessary for, performance of a Government contract or subcontract. [Ref.4, p.9]

- 5) The provisions in the April 1988 interim rule that the Government would have unlimited rights in any data not included in a list in the contract are eliminated. [Ref.4, p.10]
- 6) The requirement that offerors and contractors submit development cost data when notifying the Government that items were developed in part at private expense is deleted. However, the contracting officer may still request these data when necessary. [Ref.4, p. 10]

#### ***b. Current Industry***

While the policies of the Government are delineated in the above regulations, the policies of industry are difficult to determine. There are several rules of thumb that seem to govern industry attitudes and actions concerning technical data rights. One is that the intellectual property of a particular company is extremely important to its competitive standing. Service, engineering and high-technology businesses survive on product or service differentiation. [Ref.7, 9] The ideas and processes described in technical data submissions are a prime means for achieving this differentiation. Another rule of thumb is that companies feel that if they have contributed resources to the creation of technical data, they want ownership. [Ref.7] Patents, copyrights and classification of data as trade secrets are methods used by companies to seek to protect the technical data. [Ref.7, 10] The prevailing belief in most Government contracting activities is that the Government buys too much technical data and doesn't protect licensed data adequately. [Ref.7, 8, 9, 10]

### *c. Proposed*

In November 1991, the formation of a Government-Industry Technical Data Committee began under direction contained within the Fiscal Year 1992/1993 National Defense Authorization Act. The committee was comprised of representatives of the Government, developers of technical data, and non-developers such as spare parts or additional item businesses. The committee was required to make recommendations for final regulations to implement 10 U.S.C. 2320, "Rights in Technical Data." [Ref.4, p.6]

The findings of the committee involve 7 major topics of concern for this study. These topics are summarized below by major topic along with the crucial arguments of each group of representatives. Further analysis of these proposed changes can be found in Chapter IV of this thesis.

(1) Allocating Data Rights. 10 U.S.C. 2320 generally allocates rights in technical data in accordance with the source of funds used for the development of the technical data.

The Government desires that funding continue to be used as the allocation basis for these data rights. They believe there is less delay in the procurement action and in administrative time and cost. [Ref.4, p.7]

The data developers, or Original Equipment Manufacturers (OEMs), desire to have a default rights restriction category of limited rights assigned to Government procurements. Their argument continues in their belief that Government's minimum needs are satisfied with limited rights. [Ref.4, p.7]

The data non-developers, who are usually involved in spare parts sales and direct foreign sales, desire the Government to have unlimited rights for the data the Government has wholly funded. The more rights held by

the Government means more technical data available to them to conduct their business. [Ref.4, p.7]

The committee concludes that the source of funds test is a reasonable basis in determining technical data rights. Implementing regulations will emphasize that all Government rights will be derived from a license granted by the contractor. [Ref.4, p.8]

(2) Defining Developed Data. 10 U.S.C. 2320 requires the Secretary of Defense to provide a definition for the term "developed" as it relates to technical data. Generally, the earlier an item or process is defined as developed, the less likely it is that development involved Government funds. Thus, this concept is very important for industry and Government to define and determine in order to provide a basis for data rights ownership. [Ref.4, p.8]

"Development" is defined by two concepts, existence and workability. If an item exists, it has been constructed. A process exists if it has been practiced. Workability requires substantial testing or analysis to demonstrate that it has a high probability of operating as intended. [Ref.4, p.8]

The Government representatives are not in favor of using Computer-Aided Design (CAD) and other computer simulation tools to act as substitute procedures for actual testing of these concepts. They feel that computer simulation is not sufficient to show adequate assurance that an item can be built. They argue that there is a difference between the "as-built" item that actually is produced and the "as-designed" item in accordance with the computer simulation. They go further to state that there is case law that supports the existence concept and that simulation does not equate to existence. [Ref.4, p.9]

Representatives of the OEMs contend that tools such as CAD effectively eliminate the "reduction to

practice" criterion of the existence concept and that CAD does indeed provide the required assurance to prove workability. [Ref.4, p.9]

The non-developers opined that "actual" workability was preferred to "likely" workability. They offered that the test for existence should be the same as the patent law test of "bringing to the point of practical application." [Ref.4, p.9]

(3) Indirect Costs. 10 U.S.C. 2320 requires the Secretary of Defense to define the terms "exclusively with Federal funds" and "exclusively at private expense." The statute also directs the Secretary to specify the treatment of indirect costs other than independent research and development (IR&D) costs or bid or proposal (B&P) costs which 10 U.S.C. 2320 (a)(3) identifies as private expense. [Ref.4, p.11]

"Exclusively with Federal funds" is defined by the current data regulation as all developmental costs paid for by the Government or that development was required for the performance of a Government contract or subcontract. [Ref.4, p.11] "Required for the performance of a Government contract or subcontract" is defined by the current data regulation as meaning that the development of an item or component was specified in a contract or that development was accomplished during and was necessary for performance of a Government contract or subcontract. [Ref.5, part 227] It is this phrase that proves to be the most difficult to interpret and to reach agreement on.

The Government representatives are concerned over the possibility of the OEMs "cherry picking." This occurs when the contractor chooses the most valuable, commercially appealing intellectual property and develops it with private funds while using less "attractive" intellectual property for Government contracts. [Ref.4,

p.12]

The OEMs state that it is unfair for the Government to be able to get unlimited rights on intellectual property that has been developed while performing a Government contract, but privately funded. They believe these private funds are not directly related to the Government contract and, therefore, the intellectual property and technical data developed are not subject to restriction. [Ref.4, p.12]

The non-developers argue that the OEMs' suggestion results in technical data rights being a result of the company's accounting system rather than by actual funding. Although FAR Parts 30 (Cost Accounting Standards) and 31 (Cost Principles) prohibit indiscriminant changes to the method in which a firm may allocate indirect and direct costs, the non-developers believe that OEMs practice this procedure and will be more apt to do so if the OEMs' suggestion is carried out. [Ref.4, p.12]

The second aspect examined is the concept of "exclusively at private expense." Currently, the technical data regulation in DFARS 252.227-7013 (a)(15)(i) defines this as:

...no part of the development cost being paid by the Government and development was not required for the performance of a Government contract or subcontract.

The primary concern voiced by the data developers is that data funded from non-Government funds are developed exclusively at private expense and should be wholly owned by themselves. [Ref.4, p.12]

(4) Mixed Funding Situations. 10 U.S.C. 2320(a)(2)(e) requires the Government and its contractors to negotiate rights in data pertaining to items or processes developed at mixed expense except when the Secretary Of

Defense determines that, based upon criteria contained in the implementing regulations, negotiations would not be practicable.

The Government representatives feel that there should be a fixed GPLR license for every mixed funding situation. While the Government would have the right to use, release, or disclose data for Government purposes to a third party, the data developer would have a limited time period in which to have exclusive rights to commercialize the property. After this limited time, the Government would gain unlimited rights to the data. [Ref.4, p.13]

The OEMs claim that Government has historically demanded unlimited rights in mixed funding situations. Also, they desire to have perpetual disclosure protection instead of for five years. They feel that if the situation warrants, modifications to the standard data rights agreement should be authorized by mutual agreement during negotiations. [Ref.4, p.13]

The non-developers see this as another method to restrict their use of the OEMs' technical data. They suggest that the term "Government purpose" be re-written because they feel that direct foreign sales act the same as Government foreign sales except the Government doesn't receive the commission. They add that the committee's suggestions for additional assistance for the non-developers to conduct this business will compel the OEMs to relinquish their data rights. [Ref.4, p.13]

The committee made three recommendations in these areas: 1) a fixed set of Government purpose license rights with a nominal five year baseline commencing at contract award, with the possibility of negotiation for non-standard data rights when the situation warranted; 2) limit the use of Government purpose license rights data to Governmental purposes including competition, and; 3)

require that third party users be subject to non-disclosure statements that will be executed on behalf of the data owner. [Ref.4, p.13]

(5) Commercial Items. OEM representatives voice their opinion that separate data requirements are needed for commercial items. While it is acknowledged that DFARS 211 did that, the contractors have concerns about the 10 U.S.C. 2320 (a)(2)(c)(ii) provision that exempts form, fit, or function data from contractor or subcontractor restriction. They state that this portion of the statute hinders their company's commercial business because of possible disclosure. They would like to see DFARS 211 replaced with policy guidance concerning separation of commercial and non-commercial items, along with a DFARS 227 contract clause requiring negotiation of licensing rights whenever the Government decided it needs data rights for the commercial item(s). [Ref.4, p.13]

Government representatives agree with industry representatives on the need to consolidate additional technical data requirements in DFARS 227.4. However, the Government feels that there is a need for a separate, standard contract clause to grant the Government unlimited rights that are exempt from disclosure restrictions in 10 U.S.C. 2320 (a)(2)(c) and (a)(2)(d) and prohibit the release or disclosure of other commercial data without the permission of the contractor. The Committee supports the Government's proposal. [Ref.4, p.13]

(6) Copyrights. The Government wants specific enumeration of copyright license rights to accompany the rights granted by data rights licenses. They believe that the rights associated with copyrights are not identical to the rights associated with technical data. The representatives also seek to clarify the industry's interpretation of the phrase "Government purposes" in DFARS



252.227-7013 (e)(1). They define it to be only a limiting factor under which the Government can allow other people to use copyrighted technical data prepared for or acquired for the Government under contract. [Ref.4, p.13]

The OEMs and non-developers support the enumeration recommendation. However, they do not want the wording to be such that the copyright license rights are "in addition to" those rights associated with data rights license, due to their belief that it will expand the scope of the technical data rights license. [Ref.4, p.14]

The committee combines the copyright license with the data rights license. They recommend that the contractor or licensor grant to or obtain for the Government, license rights to reproduce, modify, perform, display, or distribute the data protected by copyright. [Ref.4, p.14]

### **3. Procedure**

From the preceding section, one quickly realizes that there is a myriad of regulations and policies that are required to be followed by both industry and the Government relating to the delivery of technical data. While these topics are being discussed and reviewed, the fact still remains that both industry and the Government need to conduct everyday business that involves technical data and technical data rights. This section will provide insight as to how the Government determines their technical data requirements.

The Government needs to be able to properly support, maintain, and repair the systems it procures. Technical data are needed to develop this support capability. Without technical data, the essential functions listed in DODI 5000.2 cannot be successfully implemented.

A question that remains is how the Government determines the minimum essential technical data needs are

determined. The answer is the "data call." [Ref.11, p.7]  
The "data call" procedure begins as the contract solicitation is developed. The Integrated Logistics Support (ILS) manager assigned to the acquisition will promulgate the Statement of Work (SOW) and other pertinent documents associated with the procurement to all of the logistics element managers. These element managers are concerned specifically with such areas as maintenance engineering, technical manuals, and initial parts provisioning. They will consider the potential technical information that will be required for the life cycle of the item. [Ref.11, p.8]

The ILS manager sends the results of the data call to the technical data manager for review. DODI 5000.2 requires that a data requirements review board be established to review all data call recommendations and advise the Program Manager as to their findings. When the acquisition has a potential cost of \$5 million or more, the review board must convene before the solicitation is issued. [Ref.12, p.9-B-3]

Each data requirement that is approved by the board is listed on the Contract Data Requirements List (CDRL), DD Form 1423. The CDRL becomes an element of the contract. Each data requirement must be related to a specific task in the SOW and fully describe the item and its delivery. [Ref.11, p.7]

Prices for the items listed on the CDRL may be negotiated. Changes to or deletions of CDRL items may be unilaterally acted upon by the contracting officer through the changes clause of the contract. If the requirements are deemed to be too excessive or too expensive, the contracting officer may eliminate that requirement while possibly subjecting the Government to equitable adjustment actions. [Ref.7] While this procedure appears to provide the minimum essential technical data, there are several elements at work to reduce efficiency. The majority of the data requirements

for an item are determined when the costs associated with the item are uncertain. Many logisticians will tend to order the maximum amount of available data to ensure logistics needs are served. In this case, the quantity of data is determined by desire, not cost. Therefore, cost is not the determining factor in this situation and the result is ordering more data than is absolutely necessary. [Ref.7]

The particular pressures placed upon the procurement action are also at work. If the procurement schedule is the primary concern, the tendency will be toward requiring more technical data. The additional technical data helps provide information that can assist in end-item procurement and serves as documentation of procurement actions. If cost is the primary concern, the tendency will be toward requiring less technical data. [Ref.11, p.9] In either case, the probability of having the minimum essential technical data is significantly reduced because these concerns are not equal for any one procurement.

#### **4. Application**

There have been several concepts identified in this introduction that can be used in understanding how technical data and technical data rights affect each procurement professional. One should come away from this first section with the understanding that there is a dichotomy of understanding between Government and industry in not only the written policies and regulations that govern this area, but also in the general attitudes and beliefs of these parties. While there have been strides taken to eliminate this dichotomy, there are still many areas to examine.

This study is intended to benefit current and future CALS users who are and who will be dealing with these topics. By increasing the understanding of technical data and what the restrictions are when dealing with technical data, these users will work smarter and more efficiently.

Since CALS is currently focused on major weapon system procurement, those associated hardware commands are the current target audience. However, the understanding of shared database computer systems is a growth area in Government procurement that will be increasingly important in the future.

The ultimate goal of this study is to allow a faster implementation process of not only the CALS system, but other shared database systems as well.

### **III. DATA PRESENTATION**

#### **A. INTRODUCTION**

The data gathered for this thesis through personal and telephone interviews and surveys are of a subjective nature. There is no adequate standard that could be used to derive statistical information and there is a lack of historical analytical information dealing with shared database system use.

This chapter first analyzes the survey itself. A discussion of the question structure, and the facilitating role of the survey is followed by presentations of the data for the major topical issues addressed by the survey: 1) the restrictions placed upon technical data by the contractors and by the Government agencies and the origins of those restrictions, 2) shared database concerns in the commercial and Government marketplace, 3) protective actions used for proprietary property, 4) the impetus for technical data acquisition by the Government, and 5) the impact of CALS on technical data rights and proprietary property.

At the end of this chapter, the reader should have a good understanding of the dichotomy that exists between Government and industry towards technical data through a discussion of data concerning what is believed and what actually is being done in the field by both the Government and industry.

#### **B. SURVEY**

The structure of the survey was intended to meet two primary objectives: clearly present information that helped in answering the thesis research questions, and provide a channel for communications between the interviewer and interviewee.

In order to meet those objectives, the questions were structured in an open-ended format. If the interviewee

wished to answer more than what was directly called for by the question, he or she was encouraged to do so. Also to meet these objectives, the questions were carefully selected from the preliminary surveys (Appendices B and C). The topics that had received the most interest and discussion during those preliminary surveys were chosen to be in the final surveys (Appendices D and E). This narrowing of topics also served to keep the survey at a manageable length. The questions selected equally represent the Government and industry concerns. Subsequently, there were approximately the same number of questions that dealt with the Government marketplace as with the commercial marketplace.

There were thirty surveys distributed to preliminary interviewees which had expressed some working experience with CALS or another type of shared database system. Twelve surveys were completed and returned. Due to this relatively small number of responses, statistical analysis was not warranted and therefore not conducted.

### **C. RESTRICTIONS AND ORIGINS**

Through the responses to the survey questions and associated follow-on questions in the same topical area, it is learned that when the Government develops a requirement that will include technical data, the technical data requirement will be stated in section H, special contract requirements, or section I, contract clauses, of the solicitation. [Ref.13] This statement usually includes a description of the data required, the desired format, and may also include the restriction category sought, i.e. limited, unlimited, or GPLR. [Ref.13]

For major weapon systems, the technical data requirements are first addressed in the acquisition plan for that particular program. This acquisition plan is to be

approved at Milestone I by the Milestone Decision Authority (MDA). It is the responsibility of the Procuring Contracting Officer (PCO) to determine the amount and type of technical data requested by the Government. If the PCO determines that a change to the technical data amount or type is required, he/she may either unilaterally or bilaterally delete the technical data from the CDRL during negotiations. [Ref.7]

Upon receipt of the solicitation, the potential offeror carefully analyzes the technical data requirements. If they already possess technical information of the same type, they may quickly see what type of protection such as copyrights or patents are applied to the information. If the technical data would have to be developed, the company's technical engineers are tasked to determine if the data could be developed, at what expense the development would be, and if there would be any type of rights restrictions the company would wish to place upon the data. This determination of rights restrictions is usually made by an in-house board of experts comprised of technical, legal, and business representatives. [Ref.7] The decision that they reach is put into the company's proposal. This process of pre-notification of rights in technical data is mandated by DFARS 252.227-7013 (j).

The proposal will address the technical data that are available and whether they already exist or will need to be developed. It will also indicate the initial rights restrictions that the company deems appropriate. In response, the Government will look at the overall proposal and determine if the company will be considered for possible negotiations that may include negotiations regarding the rights restrictions requested by both parties. [Ref.10]

#### **D. SHARED DATABASE IN THE MARKETPLACE**

The survey responses concerning the importance of technical data in the commercial marketplace show that technical data and intellectual property often serve as the key for the company's competitive edge by providing product differentiation. Several companies stated that technical data are becoming even more important due to the shrinking defense market and are vital to provide competitive advantage in both the commercial and Government markets.

The type of business that the company is involved in significantly alters the impact that technical data have on the business. The maximum impact of technical data is on a company involved in a minimal product line, multiple market applications (commercial and Government), and a high technology area. In any combination of these areas, the protection afforded to the intellectual property by the company is increased when compared to the converse condition. [Ref.13]

There is also an indication from the surveys that companies compare the attractiveness of the market and potential safety of their intellectual property when deciding what market to place their emphasis on. "Market attractiveness" was defined in the context of technical data rights as being a right restriction categorization that is usually attached to the technical information. Technical data and intellectual property ownership conditions are looked at as well. The companies are extremely interested in ownership and control of the intellectual property. They want to know what occurs in data development funding contribution scenarios and how associated FAR/DFARS regulations impact their data rights.

A clear indication by a majority of the survey responses indicates that companies hold back some of their most sensitive proprietary information from the Government.



These companies are afraid that the Government will take over ownership of their proprietary information by claiming "national interests" and will make that information available to the company's rivals in the name of competition. In a 1991 study conducted by the Proprietary Industries Association, 75% of the companies questioned stated that they had indeed withheld their latest technical data from DOD activities. Eighty-three percent of the companies had refused participation in DOD procurement actions due to disputes over technical data rights. Thirty-three percent of the companies stated that they were planning to quit doing business with the DOD altogether because of technical data reasons. [Ref.11, p.12-13]

The majority of company responses stated that they did not have trouble with technical data rights when dealing with commercial firms but did have trouble with the Government. The majority of the responding companies stated that they used some type of written agreement that dealt directly with proprietary information and technical data exchange. However, one contracting manager for a major defense company stated that this was particularly difficult to understand since most of the arguments centered around formats that were for data totally funded by the Government and therefore owned by the Government.

Many of the company representative responses indicated that they were also using teaming arrangements between companies in the development of new sensitive intellectual property. In this situation, two parties jointly develop the proprietary information. The rights to the technical data are negotiated by the teaming companies prior to the development of the information.

## **E. PROTECTIVE ACTIONS**

According to the responses received from the survey, there are several methods used by industry and the Government to protect their proprietary property and technical data: the use of FAR and DFARS clauses, copyrights, patents, and trade secrets.

### **1. FAR and DFARS Clauses**

The first of these protective measures is the use of the DFARS clauses 252.227-7013, "Rights in Technical Data and Software" and 252.227-7018, "Restrictive Markings on Technical Data." Most solicitations submitted to industry include one or more data rights clauses. [Ref.14]

The "Rights in Technical Data and Software" clause describes the manner in which ownership rights are determined on the basis of funding origins. As earlier discussed in this thesis, this aspect is being considered for possible modification. DFARS clause 252.227-7013 also provides a definition of the data rights categories, along with the associated legend that is attached to each piece of data subject to those rights restrictions.

DFARS 252.227-7018, the "Restrictive Markings on Technical Data" clause, gives instructions to the firm on exactly how to mark their technical data in order for the contracting officer to realize what restrictions are being sought by the firm. [Ref.5, part 252]

The majority of the survey respondents stated that it was very important for them to have their technical data properly marked and to have the data included as a deliverable item on the Contract Data Requirements List (CDRL). If the data are not marked, the Government may treat them as unlimited rights data. DFARS 252.227-7037 allows the contracting officer the availability to request a written justification by the contractor for any data restrictions if the basis for the restriction cannot be

ascertained by the contracting officer. This same clause also allows the contracting officer to challenge the restrictive markings. The contractor's or subcontractor's written response to the contracting officer's final decision is handled under the Contract Disputes Act of 1978. The majority of the industry and Government survey responses show that neither of these actions usually occur due to time constraints in the procurement action.

All of the contract administrators who responded to the survey stated that they were required to know DFARS clause 252.227-7013(j) which states that "offerors and contractors are required (by 252.227-7013(j)) to notify the Government of any asserted restrictions on the Government's right to use or disclose technical data or computer software." Prime contractors are required to include their subcontractor's technical data and computer software as well as their own. The respondents stated that it is common practice to include this notification in their proposal if the technical data are already in existence. If the technical data are to be developed, the offeror may notify the Government at a later time as specification and requirements become more definitive.

## **2. Copyrights and Patents**

All of the companies who responded to the survey stated that they used patents or copyrights to protect at least some of their technical data.

Copyrights were used most frequently because copyrights are easier to claim and easier to administer. Anyone can claim a copyright in an expression as it is fixed in the medium in which it is presented. An example of this concept is that as an author puts words on paper, he is afforded copyright protection on those words. The other major benefit that was mentioned most often was that a copyright is good for one hundred years if it is owned by a

corporation. One major defense contractor for armored vehicles stated that a recent inter-corporation mandate from their legal department required copyright notices on all technical data. The reason was to make the person on the other end of the data transfer handle the information more carefully. This same contractor also stated that they knew that copyright law is not the most favored protection method since it only prevents copying.

The majority of contractors stated that if the technical data are copyrighted, then they are more apt to seek licensing agreements where they may seek royalty fee payments for the useful life of the data.

Patents were mentioned by fewer corporation representatives as a method for protecting technical data. Stated advantages were that patents are very effective in that most people understand the protection afforded them under patent law. Since a patent is a seventeen-year exclusive right to a particular process or idea, it is a highly sought after method of protection. The stated disadvantages are that it takes more time and money to obtain a patent. Since much of the intellectual property is time critical, many of the contractors felt they could not take inordinate amounts of time to get patent protection unless a painstaking cost-benefit analysis was done.

One former Procuring Contracting Officer (PCO) brought up an important item to remember concerning patented and copyrighted material: the Government can use this information under the guidance of 28 U.S.C. 1498 (a) and (b). This law allows the Government to use an "Authorization and Consent Clause" which permits copyrighted works or patented ideas to be used for Government purposes. This clause includes the right for a third party to use copyrighted works or patented ideas when performing work on behalf of the Government. The data developer may seek

compensation from the Government but the courts will not allow injunctive relief.

According to responding contractors, the method that affords the contractor/offeror the best protection is treating the technical data or intellectual property as a "trade secret." Trade secrets are ideas, information, or procedures that are kept secret and that give the firm or individual an advantage over another firm or individual in the marketplace. A trade secret can be licensed to the Government (or any other contracted party) for a particular purpose in return for a licensing fee but must be kept secret from outside activities. The Authorization and Consent Clause is worded so that it only regulates copyrighted and patented information, not trade secrets. [Ref.15, p.233] The Federal Trade Secret Act (18 U.S.C. 1950) prevents a Government employee from wrongfully disclosing the trade secret to a third party. Therefore, copyrighted works or patented ideas are not necessarily afforded the same protection as are trade secrets. [Ref.15, p.236]

The representatives for the contractors stated that the important thing about using trade secret protection is to treat the information as a trade secret through policies such as employee training, restrictive viewing, and secure storage of the data.

#### **F. GOVERNMENT TECHNICAL DATA ACQUISITION**

According to the views of the Government procurement agencies expressed in the survey responses, there are five major reasons that the Government seeks to acquire technical data: 1) to establish alternative manufacturing sources, 2) to ensure that there will be a source for the goods or services if the original source is unable to meet the delivery requirements (e.g., the source having a labor

strike or by simply going out of business), 3) emergency repairs and overhaul requirements, 4) the need for maintaining competition for the product or service through the Competition In Contracting Act (CICA), or 5) the support and maintenance requirements of the systems.

The last reason is stated as being increasingly important due to the fact that more major weapon systems are being called upon to have a longer useful life. There is an increased emphasis on having a sound maintenance and support system for the entire life cycle of the system.

In accordance with DFARS 227.402-70 (c), the Government must balance the contractor's interests in data ownership with the Government's need to use the data. Additionally, DFARS 222.402-71 states that the Government should minimize the amount of data obtained. Most of the contractors, however, clearly indicated that they believed the Government requested too much technical data and sought ownership when unwarranted.

The Government representative responses voiced a similar opinion. Two former PCOs who worked for a major military systems command stated that the presiding factor for their requests for technical data was to cover possible contingencies if and when they would be asked about the technical data package included in the procurement. However, a supervisor for the CALS function at a defense contracting firm voiced the opinion that while the Government may need the information that is eventually accessed during the procurement and life of the system, it needs neither the information that is owned by the company nor the quantities requested.

Another major factor that is expressed by the Government is the cost of the technical data. According to the Government and industry responses, both feel that cost is a minor factor when looking at technical data which the

Government feels is needed for the system.

The concept of "over and above" is the method by which the PCOs stated that technical data are usually priced. This methodology has a price that is estimated based on the cost to the seller plus price parameters over and above the cost incurred if the data were not required at all [Ref.16]. These responders stated that they used this concept because there is inherent technical data generated. An associated cost for this technical data is generated as well. Examples of these types of data would be engineering drawings and testing procedures.

The responses generated from the contract administrators show opinions from the post-award aspect of the procurement. The majority of these administrators stated that they felt that PCOs used the "cookie cutter" approach when acquiring technical data. They felt that too much reliance was being placed upon the opinion of the technical experts who comprise the configuration boards and Integrated Logistics Support (ILS) personnel without adequate queries or validation. They felt that PCOs need to be more knowledgeable about technical data and technical data rights issues.

#### **G. CALS AND TECHNICAL DATA RIGHTS**

There were several issues concerning the impact that CALS has on technical data and technical data rights identified by survey responses. The survey specifically sought out information on the Contractor Integrated Technical Information Service (CITIS), the Government Concept of Operations (GCO), and the CALS Implementation Plan (CALSIP). Additionally, technical data management and standards, data security issues, and the incentives and benefits of CALS were discussed.

## 1. CITIS

The Contractor Integrated Technical Information Service (CITIS) is a contracted line item that is designed to provide a single entry point for authorized Government access to and delivery for contractor data in response to valid CDRL requirements. [Ref.17, p.17]

According to several survey responses, one of the major problems in the CITIS field is that there has been no cost analysis conducted and no apparent efficient cost control method established. According to a CALS supervisor at a major telecommunications contractor, the Government negotiates technical data funds for each program, not on an aggregate basis for the contractor. Therefore, the contractor can charge the Government several times for access to the same data. The same source stated that it is believed that these overcharges can be minimized if and when the JCALS infrastructure is in place. In this case, CITIS will be a part of the IWSDB and connected to the JCALS Global Distributed Data Management (GDDM) function [Ref.3, p.24].

Another CITIS problem is the funding required to implement the service. Only one of the contractors surveyed, who is a major CALS operator, had received level-of-effort funding from the Government for the establishment of the CITIS. One Government representative from a major systems command and a representative from the CALS Steering Group stated that without Government funding, small businesses are at a great disadvantage to larger firms because they would not have the resources available to purchase CALS equipment and to hire adequate personnel. A representative from the Office of the Secretary of Defense CALS Executive stated that it is not the intent of CALS to put small businesses at any disadvantage, and that small business status would be considered when the issue of



Government funding took place during contract negotiations. A respondent from the CALS Industry Steering Group stated that the reason for inadequate CITIS funding is that it is never seen as a Contract Line Item Number (CLIN); it is usually an "add-on" for a procurement only if the operational and performance requirements desired by the hardware systems commands are met.

Of the contractors surveyed, all stated that they were using, or were planning to use their own version of CITIS. One of the major CITIS issues is the compatibility required of an access/delivery system of this magnitude. One hundred percent of the companies surveyed stated that while they are knowledgeable that CALS demands compatibility and standardization of information across the board, they are focused on being compatible and standardized only within their own organizations. To paraphrase the words of several of the company responders, their companies are "...just now getting to the point of computer standardization; we can't worry about what everyone else is doing..."

## 2. GCO

As explained earlier in this thesis, the Government Concept of Operations (GCO) is to provide information to the contractors about the Government's strategy for CALS implementation. It also is to ensure that the Government receives the correct version and formats of digitized data products. [Ref.18, p.10]

Most of the contractors responded that they had not yet seen a GCO in a solicitation. Two of the responders stated that they thought this was due to the Government not knowing what their strategy for CALS is. Three other contractors responded that they believed CALS was still in its early stages and thought the Government was allowing contractors to come up with their own implementation strategy.

### **3. CALSIP**

While CITIS and GCO are generally provided from the Government to the contractor, the CALS Implementation Plan (CALSIP) is from the contractor to the Government. Its purpose is to provide an indication of the contractor's plan to implement CALS and in what magnitude, which serves as an indication to the Government of that company's commitment to CALS. [Ref.18, p.20]

All of the company and Government representatives agreed that the CALSIP is a key to getting CALS used in a wider context of jobs, and to increase contractor motivation to use CALS. However, only one company representative stated that a CALSIP was used. Of those who stated that the CALSIP wasn't used, the majority felt it was a Government requirement for another piece of paper that wasn't high enough on anyone's priority list to monitor and ensure compliance. The Government representatives stated that the CALSIP was viewed as being more important as the CALS concept grew--it wasn't really important in this phase of CALS.

### **4. Technical Data Management and Standards**

#### ***a. Technical Data Management***

From the survey responses of the program managers it is evident that guidance from the Government concerning a consolidated policy on digital data requirements and standardized technical data management is lacking. The program managers stated that they were confused by the wording in both DOD Directive 5000.1 (DODD 5000.1), "Defense Acquisition" and DOD Instruction 5000.2 (DODI 5000.2), "Defense Acquisition Management Policies and Procedures." These are two of the three primary DOD documents concerned with digital data management. The other publication is Military Handbook (MIL-HDBK) 59A, Department of Defense Computer-aided Acquisition and Logistics Support

(CALS) Program Implementation Guide." The program managers stated that they weren't sure when they were supposed to use digital data during weapon system acquisition. According to DODI 5000.2, digitized technical data are required unless there is a "convincing analysis" involving cost, schedule, and risk that justifies another course of action. [Ref.12, p.9-B-2] The program managers stated that because each Service has separate infrastructures for accepting digital data, it is relatively simple to produce a "convincing analysis" that shows CALS not to be an effective resource. The instruction does not direct DOD activities to contract for digital data, it merely suggests courses of action. [Ref.12, p.9-B-2]

Another document mentioned by one respondent is the *CALS Architecture Study*. [Ref.2] The respondent used the study in implementing the CALS initiative. The respondent was quite pleased with the way in which the study provided information about converting manual processes into the automated IWDSB but stated that it lacked specific methods in which to standardize and protect technical data and intellectual property.

These same program managers voiced an opinion that CALS requirements were not standardized in contract language. They believed that in a high-technology area such as CALS, it is vital that contracts contain clear, specific language that thoroughly and accurately describes the digital data requirements of a procurement action.

#### ***b. Technical Data Standards***

A major aspect of CALS is the standardization of technical data entry and access. Commonality of data enables fast and efficient data exchange between DOD and industry. [Ref.17, p.1] However, according to a representative from the Office of the Secretary of Defense (OSD) CALS Executive, there have been delays in the

development of digital data standards. Most of these delays were thought to be because there is a continuing discussion as to who is responsible for developing the standards.

Another of the main contributing reasons for delay is the use of optional standards. Military Specification 28002A specifies the use of raster graphics. Raster graphics is a method of storing graphics information such as technical drawings and blueprints [Ref.18, p.56]. This specification allows choices between and within two choices of data: tiled and untiled. According to the DOD Inspector General report, "Management of Digitized Technical Data", the use of these options results not only in increased flexibility but in increased costs as well. When these options are used, the information systems end up paying for two types of data to ensure system compatibility. The Army's Digital Storage and Retrieval Engineering Data System (DSREDS) is an example. [Ref.3, p.65]

#### **5. Technical Data Security**

According to the respondents, CALS is designed to prevent unauthorized access to technical data and proprietary property. Since CITIS is the data access and delivery method, it is the prime tool used for guarding access to this information. [Ref.17, p.2]

The respondents to the survey stated that since CITIS was generally developed by each contractor's shared database, security measures that are in place are not trusted nor are compatible with other company's measures. Survey responses indicate that the security measures utilized by the Army's JAVELIN program, the Air Force's B-2 program, and the Navy's AEGIS program are totally different and inconsistent with each other. Therefore, Program Managers have to deal with a wide diversity of security requirements.

In the words of a major armored vehicle defense

contractor, "A shared database is a frightening thing to a contractor." The contractors simply do not trust a Government-operated system that appears not to have any type of guidance or structure for technical data security from top-level Government management. They demand protection for their intellectual property and technical data and do not want their competition possibly to gain access to it.

The same contractor said that CALS is soon to be used on their major armored vehicle program. This change is not due to the contractor becoming aware of the benefits of CALS or CALS improvements, but only because the vehicle program is mature enough to face the risk of technical data disclosure. They go on further to state that if they were to develop a high-tech, complex vehicle or other item, they would not implement CALS for the program voluntarily because they fear possible disclosure of their technical data.

#### **6. Incentives and Benefits**

The responses of the program managers and the contracting officers show that there is no evident incentive for them to use CALS in a procurement action. None of the responses indicate any evidence of CALS training or promotion within programs they had experience with.

One of the reasons for this dilemma is that there are no established standards that have been enforced for CALS. Without these standards procurement officials are hesitant to commit to the CALS system.

Another reason is that CALS ends up costing more than manual systems. Often, hard copy technical data are requested in addition to digitized data because of the lack of a standardized access and due to the fact that a significant number of procurement personnel do not trust digital data. This mistrust is associated both with the lack of standards and the archaic attitudes against computer use.

The respondents from both the Government and industry stated that there is no current method in which to measure the value (benefits) of the CALS system. For the Government, there is no single budget line-item for CALS. Appropriated funds that were originally programmed for hard copy technical data are used to fund CALS digital data.

## **H. SUMMARY**

The dichotomy that exists between the Government and industry is manifested in the data presented in this chapter. Both the Government and industry realizes that technical data and intellectual property are extremely valuable and necessary for both parties to conduct business. However, the two entities' approaches are quite different.

The Government is mandated by DFARS 227.402-70 (c) (1) (2) to conduct a balancing act that allows the Government to acquire technical data to stimulate competition and to lower costs while allowing industry to hold technical data close that provides them with product or service differentiation and an edge in competition. This alone recognizes that there are two schools of thought on the economic interests for technical data.

CALS itself presents an interesting conflict in that its design is to provide access of standardized data to a wide user base. However, security and unauthorized disclosure are two of the biggest concerns with CALS that are voiced by the survey respondents.

#### **IV. DATA ANALYSIS**

##### **A. INTRODUCTION**

As presented in Chapter III, there were seven topical issues uncovered by the survey. In this chapter, those same topical areas will serve as the structure for presenting the analysis of those data. Additionally, there will be a discussion of the proposed FAR and DFARS regulations followed by an interpretation of how the proposed changes will affect a CALS environment. A summary that will draw together the highlights of this section will follow.

##### **B. RESTRICTIONS AND ORIGINS OF TECHNICAL DATA**

Consideration for technical data and technical data rights is done during the "data call." Here, experts from the various functional fields determine what technical data are required for a particular procurement and what rights restrictions are sought. [Ref.11, p.7]

A major problem with this procedure is that the functional experts are usually separated from the contracting and business personnel. This can be seen as separation by different offices, different areas of the same building, or different buildings altogether. People on both sides are not familiar with how the other side operates or thinks. [Ref.7] Another problem that can be associated with the problem described above is that the functional expert's opinion is seldom challenged [Ref.7]. It is associated with the above problem in that if the contracting personnel don't know exactly what thought processes, need assessments, or performance analyses went into the expert's decisions, they will challenge the requirement much less than if they knew of these intricacies. Conversely, if the functional experts were made more aware of the different contracting methods the Government may utilize to gain access to technical data without owning the data, they might be able to request only

the needed technical data for the procurement and the appropriate rights restrictions.

Too many times, the functional expert's performance is judged upon the amount of technical data that they require or have sitting on their desk. The supervisors in each of the areas are not monitoring (and reducing) the amounts or types of technical information that is being requested before it has a chance to get to the contracting personnel. [Ref.7,16] Once the foundation has been established by the functional experts on what technical data they believe are needed, the solicitation is used to describe exactly what the contractor is to provide to the Government. Too many times the solicitation is used as a "wish list" for technical data instead of what data are actually required to perform the procurement. Consequently, this results in additional time and money committed to the acquisition process by the contractor and the Government. The contractor must analyze and evaluate the technical data requirements before they can properly submit their proposal. The Government must invest more money for the contract, more time in the development of the solicitation itself and later in the procurement process when technical data administration costs materialize, and in the time and money invested in additional DOD auditor tasking to evaluate the contractor's cost estimating system.

Since the Government is required by DFARS 227.402-70 (c) to balance its needs for technical data against the protection of data rights for the contractor, a proper assessment of technical data requirements must be conducted prior to issuing the Request For Proposal (RFP).

[Ref.7,9,10] In order to maximize the impact, the assessment needs to be accomplished before the engineering and manufacturing development phase (phase II of the major weapon acquisition process) begins.



There seems to be a lack of training in the area of technical rights restrictions. The functional experts who originate the restrictions know little about the licensing methods available through the FAR and DFARS, such as Government Purpose License Rights, and the difference between restrictions sought in a commercial application versus those sought in a Government application. [Ref.10,16]

### **C. SHARED DATABASE IN THE MARKETPLACE**

In this area, the biggest question is why will/why won't industry enter into a shared database with the Government. Businesses are moving away from the Government marketplace and toward the commercial marketplace [Ref.19]. The reasons for this movement are varied. The downsizing of DOD and the tightening of the DOD weapon system procurement budget certainly are general factors. [Ref.9] As far as technical data, industry is moving away from the Government for a variety of other reasons.

Industry believes that the Government seeks access and ownership of too much technical data. Detailed technical data can give a company a particular niche in the market. If the company enters into business with the Government, the company usually fears that the Government may disclose the information to a competing firm. [Ref.7,8,9]

Industry doesn't want to venture into a Government shared data base system where they fear a lack of control over their technical data. [Ref.10] While some of this fear is well-founded, some of it is not. An example would be that while CITIS is a data access system only for CDRL data [Ref.17, p.1], many industry personnel who responded to the survey believe that providing proprietary property to an access system that has many users is not a good business practice.

Industry favors working in an environment which allows less regulation over technical data rights [Ref.9]. Several industries are familiar and quite comfortable with less formal agreements or teaming arrangements that would be virtually impossible to conduct with the Government in a shared data base setting.

When discussing the possibility of entering into a shared data base system with the Government, industry seems to be well acquainted with the Government's history in computer systems. CALS itself was initiated in a segmented, fragmented, decentralized manner in 1985 [Ref.20] and much of industry feels that it hasn't changed significantly. Non-standardization of data access and security along with system incompatibility within Government activities and between the Government and industry are seen as major obstacles in the full implementation of the CALS initiative. In a period of more than eight years, the Government has spent over \$5.2 million on the CALS system, which will need modifications in areas such as accessibility and security, [Ref.3, p.82] before it is to achieve major acceptance.

#### **D. PROTECTIVE ACTIONS**

As structured in Chapter III, this section lends itself to being discussed in a convenient manner by first looking at the regulations delineated in the FAR and DFARS. An analysis of copyright, patent, and trade secret protective actions will follow to allow the reader to gain a concise picture of a wide-ranging set of issues.

##### **1. FAR and DFARS Clauses**

Industry is very concerned over the wording in the FAR and DFARS clauses for technical data rights. In DFARS 252.227-7013 (a) (11) , "Rights in Technical Data and Computer Software," the clause states that "any cost of development that was paid for in whole by the Government or

that the development was required for the performance of a Government contract or subcontract" (italics added for emphasis) is subject to unlimited data rights for the Government. This can be interpreted too broadly. DOD's interpretation potentially covers any data that a contractor might use in the development of a weapon system under contract, even if the contractor doesn't charge the Government the development cost. Thus, contractors are hesitant to use a new process or item in a procurement action due to the additional risks faced by the Government claiming unlimited rights. This leads to the contractor holding new, improved processes or items for commercial applications since they can possess more data rights in that marketplace.

It is the general opinion of both the Government and industry that funding source is the best known method by which to assign ownership. [Ref.4, p.42] While this situation is more easily decided when the funding is exclusively from one party, the issue becomes muddled when mixed funding has occurred. There seems to be a failure on both sides to examine the situation to determine the applicability of alternative rights restrictions such as GPLR. The Government's fear of losing complete control of the technical data rights remains to be that they may need the data someday for competition or if the original equipment manufacturer goes out of business. [Ref.19]

According to DFARS 252.227-7037, restrictive markings on a firm's proprietary property remains a mandatory action. In the recent past, the Government did not fully comply with these markings and at times ignored them altogether. Today, the Government does not challenge the proprietary markings enough. The contracting officer checking these markings is aware of the legal backlash and the time delays that they could possibly face in the event they suspect that the

nature of the data does not match the associated restrictive marking. Therefore, it's simply not worth the time and expense to challenge. The companies have recognized this shift and have begun to liberally interpret their own restrictions and definitions to mark their data in a more protective manner. [Ref.7] Most of the companies interviewed not only marked their data in the manner delegated by DFARS 252.227-7013, but they also marked it in accordance with their own internal restriction labels as well. [Ref.8,10] It seems that industry is well acquainted with the FAR and DFARS clauses and have found a way in which to make them work in their favor.

## **2. Copyrights, Patents, and Trade Secrets**

Associated with industry's liberal use of restrictive markings is the use of copyrights. In accordance with copyright law, anyone can copyright work that they create. In response to their own fear that the Government will seek unlimited rights in technical data, industry has begun to copyright extreme amounts and types of data. As discussed in Chapter III, one company had their legal department issue a mandate for affixing a copyright notice to all technical data associated with a Government contract. Conversely, the Government knows that copyright law is very difficult to interpret and to prosecute against. [Ref.14]

Patent protection seems to be more effective for technical data rights. However, there is more time and money needed to be spent to get patent protection than copyright protection. Industry seems to use patent protection only for property it deems as most valuable. [Ref.14]

The Government may still use copyrighted or patented data through the "Authorization and Consent Clause" of the contract. It is believed that the Government would resort to this clause only if absolutely necessary due to the

compensation required.

#### **E. GOVERNMENTAL TECHNICAL DATA ACQUISITION**

There seems to be two groups of reasons for the Government acquisition of technical data: the "official" reasons and the "unofficial" reasons.

The "official" reasons are stated in DFARS 252.227-7013 (a)(15)(i): 1) establishing alternative manufacturing sources; 2) ensuring there will be a source if the original source is unable to meet the delivery requirements; and 3) emergency repairs and overhaul requirements. Although each of these reasons might come into play at some time in the future, the possibilities seem to be remote. Because of the current industrial base volatility, the second stated reason may be faced if the supplier(s) go out of business or remove themselves from Government contracting. The inability to meet delivery schedules may also be the scenario faced if the Government chose to modify the original contract for the procurement of additional items after the company has completed its production run. This situation is very costly to the Government and has the chance of being very profitable for the company. It is not really clear why the Government seeks alternative sourcing. It seems that the real reason is to get the lowest possible price. In these times of no real specific national threat, the emphasis is on cost control. If the sponsor of a particular weapon system can't get the system under budget, he or she is forced into making the decision of either modifying the system, convincing the fund providers (the Defense Planning Resources Board for weapon systems) that the system is actually needed, or scrap the system completely. [Ref.11, p.6] However, the real focus in pricing should not be on obtaining the lowest possible price, but in obtaining a "fair and reasonable price." The concept of a "fair and

reasonable price" describes a conclusion that the price is acceptable to both the Government and the seller. Consideration of factors such as maintenance and delivery costs along with price must be made before this agreement is reached. [Ref.23, p.2-7]

The "unofficial" reasons for Governmental acquisition of technical data seem to be: 1) to cover the Competition in Contracting Act (CICA) requirements; 2) to cover any possible requirement for technical data that may surface during the life of the system; 3) to verify the different contractor processes used during the contract; 4) to cover maintenance and support requirements for older systems; and 5) cost.

Although it may seem peculiar to classify CICA requirements as an "unofficial" reason, many of the Government contracting officers interviewed stated that CICA was not an "official" reason. However, it seems doubtful that a regulation with such a wide spread coverage as CICA would not be a major factor. Contracting officers and their procurement activities are subjected to periodic reviews such as Procurement Management Reviews (PMRs) and Contract Management Reviews which look at the procedures used during the awarding of a contract to determine whether the field activities are supporting Government policies [Ref.22, p.179] such as CICA. If the contracting officer hasn't established the "full and open competition" requirement of CICA, the review grades and the contracting officer's career are likely to suffer.

The need to acquire technical data for the present and future requirements of the weapon systems is partially due to actual envisioned needs, and to some degree needs that usually never materialize. [Ref.7] It seems that a significant portion of the technical data acquired are excessive. The procuring contracting officers interviewed

stated that this practice was due to the need to look like they were covering all possible system changes, and because the amount of technical data they ordered was the same amount that was always ordered. It appears that contracting officers face possible severe pressures for the seldom-occurring situation of the system requiring technical data in the future that wasn't ordered in the present. No one wants to be the person responsible for such an occurrence even if it means that the Government pays more money than it should for the majority of situations. A lack of understanding the intricacies of technical data rights and a lack of effective acquisition planning are leading candidates for causing this dilemma. [Ref.7,16]

The Government needs technical data to verify the contractor's processes employed during the life of the contract. Technical data are used to analyze virtually all aspects of business; development, production, manufacturing, and accounting are just a few specific areas of Governmental interests. The real question becomes: "Does this need require *ownership* of the technical data or *access*?" Historically, the Government has succinctly answered, "Ownership!" [Ref.6,9,10] The Government has been in the position for quite some time of being able to buy the ownership rights to all the technical data it wanted. This allowed the Government to maintain control over technological advancements made in defense systems, to assure itself of maintaining an industrial base, and having several competitors to guarantee the lowest prices for these formidable systems. Can the Government continue to do this? By all indications, it appears not. Another reason for data ownership appears to be a lack of training of procurement personnel concerning the alternative methods of gaining access to technical data. There were no respondents to the survey who knew of any training held for procurement

personnel concerning technical data and technical data rights. Technical data requirements are generally formulated during the development acquisition phase when there are still many uncertainties existing [Ref.4, p.3]. Although this method can provide quicker budget estimates for technical data, it also demands careful, farsighted planning that is periodically less than fully realized. Planning that concerns the status of the equipment manufactures, alternative sources, system life cycle, maintenance and supportability, and threat posture all must be considered in order to determine the correct amount and types of technical data to require either access or ownership. Too often, technical data requirements are realized in the later production phase. An adequate assessment of technical data requirements must be conducted prior to the engineering and manufacturing phase of weapon system acquisition. When the contractor has already proceeded to provide hardware for the contract, additional data requirements will invariably cost the Government inordinate amounts of money.

As the budget for weapon systems continues to decrease, there is a corresponding increase in the life expectancy requirement of the weapon systems and an increased demand for additional maintenance and support funding for the older systems. Along with this situation is the desire that more of this support and maintenance be accomplished by outside contractors because of the downsizing in military personnel and the decrease in training funds. All of these factors combined seem to indicate an increase for technical data in the maintenance and support areas. This increase calls for even greater focus on coordinated planning for the shrinking data dollar.

There are two major cost elements involved with technical data: 1) development and preparation costs



involving labor, research and development, design, etc., and 2) production costs involving mostly material and processing costs. These are usually treated as indirect costs. [Ref.6] Although these elements have been identified, the Government seems to ignore the interacting effects of all these elements. It is estimated that 30% of the total contract cost is spent on technical data administration functions for data required by the Government. [Ref.7] The overwhelming governing factor seems to be the need for the data, not its cost. There appears to be no existing governing research conducted on the differing cost elements and how they affect the cost of technical data. [Ref.25, p.13] While individual Government price analysts are able to identify some of the cost elements, there is no Government-wide research that identifies all the cost elements and how they affect technical data cost.

One problem with the Government's practice of procuring technical data is that they use the solicitation as a "wish list" for the data they would like to acquire instead of for what is actually needed. This request for excessive data adds a great deal of time and money to the procurement process due to the required involvement of DOD auditors and the evaluation of the contractor's cost estimating system. [Ref.23]

The timing of technical data funding is also an area of concern. Often, the Government will seek funds too early in the acquisition process while not being fully knowledgeable about the technical data requirements. If the data requirements are amended to include additional data items, the amount of funding is insufficient and results in a disproportionate increase in funds. [Ref.7,19]

As of now, there has been no long-term cost-benefit analysis conducted to support major investments made in the area of CALS or similar shared database computing systems.

[Ref.4, p.85] Normally, a long-term cost-benefit analysis provides an adequate level of support to the acquisition manager's decision-making process. Because CALS has been a "push-demand" item (mandated from the top-down), it has been developed without total regard towards whether industry or the Government can live with it or without it.

#### **F. CALS AND TECHNICAL DATA RIGHTS**

MIL-STD-974, Contractor Integrated Technical Information Service (CITIS) calls out Contract Data Requirements List (CDRL) items to be included in the CALS shared database [Ref.17, p.5]. However, all of the defense contractors surveyed indicated that they were most afraid of the loss of control over their proprietary data. These proprietary data would not be on the CDRL, and therefore would not be subject to disclosure. When asked about this, half the contractors stated they weren't aware of that particular statement and half stated that although they had seen the statement, they weren't sure that the Government would adhere to it.

The scenario of recompetition is becoming more likely in this era of industrial base reformation. In this situation, a weapon system contract migrates from a sole source to a competitive procurement. The question of what happens to the technical data and who maintains what data rights is a resulting unknown. Typically, a "bidder's library" is constructed by the incumbent contractor. This library usually only contains form, fit, and function technical data. These types of data are not the sensitive, proprietary data that most of the contractors are worried about. These form, fit, and function data are just enough to provide the possible alternative sources with a system description. [Ref.16] Although many of the interviewed contractors see this as a problem in a CALS system, it is

believed that they are once again forgetting that the technical data involved in the accessible database are CDRL data, not proprietary, and therefore not a problem unless the Government decides to seek additional data. If the scenario should play itself out to where the possible alternative contractor needs more than the form, fit, and function data, the incumbent contractor could establish a licensing arrangement, if the data are protected by either a copyright or a patent, or could engage in negotiations for the data if not copyright or patent protected.

An evident weakness in the current status of CITIS is that the JCALS ability to connect data bases with other CALS systems has not yet been implemented. Since this connectivity ability only pertains to CALS systems, the Army has directed that cost effectiveness be proven. The JCALS connectivity, when implemented, would serve as the single entry point for access to contractor data, thus significantly reducing costs. [Ref.4, p.34]

The GCO and CALSIP have been instituted but not one of the respondents have used them in assisting them in CALS implementation. These documents are tools that contractors and the Government should be using to provide information as to the Government's plans for CALS and the contractor's plans for CALS. These documents may provide some of the very information that is lacking.

#### **G. PROPOSED REGULATION CHANGES**

The proposed changes to technical data rights guidelines have a far-reaching effect and could change the manner in which Government does business with industry in the future.

As presented in Chapter II of this thesis, there are six major areas which are of major concern in this study. These six areas will be analyzed in this section.

## 1. Allocating Data Rights

In looking first at the Government's position, the question of "What would be a better method to allocate data rights than funding contribution?" comes to mind. Ownership and the rights associated with ownership of property have historically been bestowed upon whomever pays to own those rights. This is a fundamental aspect we have embedded in our own capitalistic system. If the funding party then chooses not to own the rights to that property, then the rights and property can be given to another party in a legal transaction. This transaction can be selling the rights of ownership or simply giving the rights away. Since technical data rights and intellectual property are usually considered too valuable to give away, it should follow that they be sold. Therefore, the Government's position to maintain the funding method of allocation seems to be adequate.

The OEMs' position seems to take the Government's position one step further. The possibility of legal problems and procurement delays are major concerns with this position because whenever the Government feels that they have contributed more funds, it would be the Government who would have to conduct the unilateral contracting action of changing the data rights restrictions. Unilateral actions are highly susceptible to future legal squabbles. [Ref.11, p.15] There would be several questions that would need to constantly be answered, such as: "How much increase in funding calls for an increase in rights restrictions?," "Are the limited rights specifically for protecting data from possible disclosure to commercial companies or would it be for Government purposes?". This position virtually guarantees the OEMs with 100% ownership of all technical data unless there is unilateral action on behalf of the Government.

The Government-Industry Technical Data Committee

appears to have adopted the underlying principle that data ownership should go to the party who funds its development. However, these non-developers are not following this principle when they propose that the Government take data rights it has not paid for. The non-developers view the OEMs' opinion as taking away the possibility of being able to use the OEMs' technical data for such actions as direct foreign military sales and spare parts sales. They are fearful that if the OEMs are subjected to less rights restrictions, they will be put out of business. Again, the point is that property ownership and control should go to the party who pays for it.

A significant number of these non-developers are small businesses. The Government has several regulations and policies regarding the protection of these small businesses. As suggested by the Chair of the Government-Industry Technical Data Committee, expansion of the regulations could be made to assist these small businesses. [Ref.4, p.13] Examples would be having the contracting officer assist the small businesses in obtaining manufacturing process data in order to produce repair parts, and having shorter GPLR periods to allow non-developers data access that is required for spare parts manufacture. These suggestions appear to assist the small business non-developers without equal consideration given to the OEMs. What is being sacrificed by the non-developers? It appears that the topic of adequate compensation has not been addressed.

## **2. Defining "Developed Data"**

The question of determining when the technical data are developed is important in determining the rightful owner of the technical data rights. The point at which the data are found to be developed is the point at which funding for the data is determined. Since funding is the current method used to determine data rights allocation, development

determination points actually result in data rights allocations.

The focal points of this proposed change are the "existence" and "workability" concepts. The "existence" concept states that an item exists if it has been practiced. That is, the idea has been applied to a situation similar to the actual event. The "workability" concept states that there is a high probability of the item operating as intended. [Ref.4, p.7] Do these concepts make sense for technical data and intellectual property?

CAD and other types of computer simulation can give estimated probabilities of workability, and these estimates are getting closer and closer to actual probabilities found in non-computerized testing. These computer simulations will also reduce overall costs of technical data because there is no need to have the actual item or process; all that is required is the computer simulated item or process. [Ref.6,16] It is felt that these simulations are as good as the real thing in certain circumstances but may not be in other situations due to the relatively immature nature of computer simulation in Government procurement. The attitudes that accompany CALS implementation and use also accompany computer simulation- its advocates will have to develop environments that will support computer methods. Computer simulation supporters must also remember that the Government spends too much money on technical data to rely on simulated images that may or may not be reliable. CAD and computer simulations will undoubtedly have a place in Government procurement, but only after they have been proven and practiced over a wide range of items and processes.

Intellectual property exists merely as an idea; what is actually of value to the Government and industry is the idea, while the technical data merely represent that idea on some type of medium. It would be impractical for a

company to acquire an idea that hasn't been represented on some readable medium. Therefore, both concepts must be present and verified in order to have technical data that are of worth to the buyer or developer.

### **3. Expenses and Indirect Costs**

This argument actually explores two issues: the classification of data development private expense as indirect expense, and the "required for performance" criterion.

First, industry wants to get as much data development expense possible to be classified as indirect cost because 10 U.S.C. 2320 identifies indirect cost as private expense. Industry may then declare that the technical data are developed at private expense instead of Government expense and claim ownership rights to the data.

In the above situation, the question arises about how manipulative a company may be in the classification of their expenses. Certain national defense contractors and subcontractors are required to comply with cost accounting standards, to disclose their cost accounting practices and procedures in writing, and to follow those disclosed practices and procedures consistently. FAR, Part 30 provides the guidelines used when deciding whether a proposed contract may require CAS coverage. The contracting officer includes a notice to that effect in the solicitation. Usually, the contracting officer will not award the CAS-covered contract until the Administrative Contracting Officer (ACO) has determined that the statement of disclosure is adequate. This disclosure provides an explanation and description of the contractor's or subcontractor's accounting system and how particular costs will be treated. [Ref.24, p.3-8]

The Government representatives believe that the removal of the "required for performance" criterion would result in

technical data rights being driven by accounting practices and would allow the companies to selectively protect technical data by charging development costs as indirect expenses.

The Armed Services Pricing Manual (ASPM) defines direct costs as "any cost that is specifically identified with a particular final cost objective" (FCO). An FCO "is one to which both direct and indirect costs are allocated (e.g., a project or a contract)." An indirect cost is:

any cost not directly identified with a single FCO. It is identified with two or more FCOs or at least one intermediate cost objective later allocated to FCOs. [Ref.24, p.6-19,20]

According to these definitions, it would appear to be quite difficult for companies to manipulate their expenditures as feared by the Government. Although there is a possibility for companies to charge "insignificant" direct costs as indirect costs, these insignificant amounts would probably not be associated with typically high-priced, high visibility technical data. Contractors are already permitted to use their own accounting system as long as it is consistent, is in accordance with generally accepted accounting principles and practices appropriate to the particular circumstances, and results in an equitable distribution among the different products sold. [Ref.24, p.3-9] Therefore, it appears that there are already adequate regulations and monitoring activities to ensure those regulations are enforced. The removal of the "required for performance" criterion would not have a long-reaching affect on the question of accounting procedures but would provide incentive to the companies to develop their best technical processes while under a Government contract.

In the question of treating data development costs as indirect costs, it appears that the Government and the



company will have to derive a method of being able to understand and agree upon cost treatment procedures before the actual contract award. This will eliminate possible negotiation delays and legal entanglements and would help provide accounting system consistency for the Government to monitor.

Once a viable cost treatment system is formulated, its impact will be to increase integration between the Government and commercial marketplaces. By defining all private costs as indirect costs, companies will no longer fear that their privately funded intellectual property and technical data will be taken over by the Government.

#### **4. Mixed Funding Situations**

10 U.S.C. 2320 and DFARS 227.402-70 states that DOD is required to negotiate for technical data rights in situations of mixed funding. The question for this issue thus becomes whether these guidelines should be used or should they be changed to allow for GPLR in mixed funding situations.

In answering this question, the definition of mixed funding must be arrived at. If the Government contributes only \$1 for data development, is that mixed funding? Is a 40%-60% Government-Industry contribution share appropriate? Why not go back to the old "50-50 rule"? While it is acknowledged that negotiating GPLR licenses for each procurement is time consuming, it is believed that both parties can be best represented where specific characteristics associated with the transaction can be addressed in one arena.

In a GPLR situation, the Government can disclose, use, or release data for Government purposes.

The term "Government purposes" is not clearly defined. DFARS 227.401 (14) provides only a cursory definition of Government purposes by stating that:

Government purposes include competitive procurement, but do not include the right to have or permit others to use technical data...for commercial purposes.

With this type of a definition, a myriad of other transactions might qualify as "Government purpose" such as direct foreign sales and foreign spare parts sales. This type of an inclusion would greatly benefit the non-developers of technical data since these transactions are their focus. The committee's recommendation for GPLR also includes the provision for a five-year period in which the data developer would have an exclusive right to commercialize the data. After this time period, the Government would receive unlimited rights. While this may take some of the burden off the Government in administering the GPLR rights, it will have an adverse effect on the commercialization of the item. In the commercial marketplace, industry can seek to commercialize for an indefinite time period. If the data rights opportunities are different when dealing with the Government, industry will seek the more appealing marketplace.

#### **5. Commercial Items**

In these times of shrinking budgets and a shrinking industry base, an appropriate use of commercial items is one method used to reduce procurement costs and integrate the Government and industry markets. It is a belief of many Government and industry representatives that more commercial products should be used to fulfill Government needs to lower costs and to broaden the competitive base. [Ref.9,14,14] This has been difficult to achieve since the executive agencies have vast numbers of people and facilities whose purpose is to provide detailed design specifications. These design specifications effectively narrow down the item or process to a point where no commercial item or process will

meet the specification requirements.

The technical data deliverables associated with commercial items or processes are usually different from those associated with new development items. Although the data are dependent upon the item or process, the technical data typically delivered for commercial items or processes include technical manuals or operator instructions. [Ref.25]

Industry may also modify noncommercial items to make them have a commercial application. Humvees, and 747 jet aircraft are but two examples. If the original item has associated technical data that were developed exclusively at Government expense, the Government has unlimited rights to those data. However, the additional technical data required solely for the modification are owned by the company. The Government only retains unlimited rights in the original, unchanged portion of the data package. [Ref.25] How often will the Government be satisfied with procuring items without the modifications? How long will industry keep providing the non-modified items to the Government? It is believed that the answer to both questions is, "Not long". The Government, as with most buyers, will desire the "new and improved" versions of the items purchased. This would be especially true if the modifications deal with safety. Industry will not be able to economically provide the non-modified items over the long-run. It is believed that the price of the non-modified items would be higher even over the short-run as well.

What this appears to mean is that the Government must find a method by which industry can protect their commercial rights while the Government gets the technical data required to operate their items.

The Government desires to have a separate contract clause which would allow them to have an unlimited license for data which is statutorily exempt from use or disclosure

restrictions. (These exemptions are found in DFARS 252.227-7013 (b), (i) through (viii).) Although both parties are seeking differentiation between noncommercial and commercial items, it is doubted whether a statutory clause is needed for rights guaranteed in another DFARS clause. It would be sufficient to specifically address the commercial and noncommercial application in DFARS 252.227-7013 (b).

Industry representatives are concerned by the Government's ability to disclose form, fit, or function data for commercial items without restriction because of the possible negative impact on commercial business. 10 U.S.C. 2320 (a), (2) states that form, fit, or function data cannot be restricted for Government use. Since the political pressures are currently aimed at using commercial items in more applications for Government procurements, Government procuring agencies have a vested interest in promoting the use of commercial items. If industry is not afforded statutory protection, they will be most unwilling to use commercial items. [Ref.10]

#### **6. Copyrights, Patents and Trade Secrets**

It is believed that the recommendation of the Government-Industry Technical Data Advisory Committee to combine the copyright license and the data rights license is not the best solution. The Committee recommends that "the Government, and others acting on its behalf...(shall have license rights) to reproduce, modify, perform, display, or distribute the data." [Ref.4, p.23] These words are taken directly from copyright law and only address protection against copying existing data; they do not address the protection afforded to the idea contained within the medium. The idea is the actual object of worth to industry and the Government and must receive adequate protection. Current versions of the FAR and DFARS do not specifically address the concept of the idea(s) associated with technical data.

Both parties need to understand what is protected and what is not in the Government statutes through a thorough and specifically worded FAR and DFARS.

#### **7. Data Repositories**

This particular area is one of the more central topics in the CALS system. It appears that Government's concerns center around the lack of resources capable of being devoted to having centralized Government repositories. Industry seems concerned with frequent occurrences of missing, incomplete, or obsolete data at the Government's data repositories.

The mere thought of possibly having as many repositories as prime contractors is staggering. Several questions immediately come to mind, including: "What are the competition implications encountered during the quest to find these ultimate data managers?", "How will this affect Office of Management and Budget (OMB) Circular A-76 provisions that protect Government employees that work on jobs that are inherently governmental?", "Who is going to pay for this effort?" This type of arrangement could adversely affect subcontractors who would typically be possible vendors but who are also competitors with the prime contractor. It is doubtful that the prime contractor would make technical data available to the subcontractor in this case.

To allow this type of arrangement, certain considerations by both parties would need to be made in order to support a workable system without undue burden being placed upon one party. With the existing trepidations already facing the success of CALS it would be unwise to add to them in this manner.

## **8. Proposed Regulation Changes**

As proposed by the Committee, these proposed regulation changes concerning technical data rights will affect the CALS environment by their affect on those who are using CALS and the environment in which it's operated.

The Committee has chosen two circumstances in which the existing procedure is maintained: using the funding source of data development as the allocation method to allocate data rights and the definition of "developed data."

For CALS, maintaining funding as the data allocation method means that the data developers will continue to exercise control over the technical data. However, they won't have as much control if their proposal of having the Government receive limited rights as a default condition was recommended. The non-developers will have to pay for access to the data owned by the companies and will have "free" access only to the Government-owned or licensed data. They will also have to remember that all implementing regulations will emphasize that all Government rights stem from a license granted by the data creator. This philosophy goes along well with the existing CALS structure of having prime contractors as data repository facilities. Based solely on this criterion, the numbers of data developing contractors who are willing to use CALS may increase. If these contractors are able to keep ownership of data they have developed and if they are put in charge of their databases, more will view CALS as an attractive tool. However, the non-developers of technical data will be less attracted to CALS. Generally, these contractors are smaller businesses who don't have the resources available to develop technical data. They must then rely on the Government and the data developers to provide them with database access. By keeping the definition of "developed data" as it exists and virtually discarding the capabilities of CAD and other

computer simulation tools, the Government has once again slowed the integration of the computer into procurement. While there are needs to ensure that the computer simulation techniques are "tried and true," the overall perception that seems to be held by the Government is that a computer is not to be trusted. This perception is also held for CALS itself. It seems that the Government is seeking guarantees for this aspect of technical data and will not settle for anything less.

The larger, data developing companies would be impacted by this decision less than the smaller, non-developers in CALS, unless these companies had already invested heavily in computer simulation systems. The developers would have the resources to physically test their items for existence and workability. The non-developers would like to move toward computer simulation of these requirements because of less resource commitment and the equalizing effect that automated processes can have on large company, small company irregularities, such as economies-of-scale.

The Committee chose three areas that are seen to increase the integration of commercial activity and have a positive impact on CALS: the redefinition of indirect costs, the separation of commercial items from noncommercial items, and the enumeration of copyright license rights.

By redefining indirect costs, the Committee apparently realizes that this issue is one of the most critical to technical data rights and CALS. The new definition proposal serves to provide both clarity and simplicity to an area that has traditionally been one of great confusion and misunderstanding. The data developing companies will no longer fear that the Government may take over data rights control over property that was developed while under a Government contract but with private funds. This increased integration helps CALS by attracting more data developing

firms into the Government marketplace. This additional method of protecting a company's technical data will provide database security that many contractors are wary of under the current guidelines and operating procedures for CALS.

This new definition may also provide impetus for nondeveloping firms to become data developers. Increased ownership boundaries and rights restrictions could mean needed product and company differentiation for survival in the marketplace.

The separation of commercial items carries the same type of implications. Increased integration of the Government and commercial markets will attract additional companies into the arena. For CALS, it carries the message that data developing companies won't have to be concerned with exposing commercial data, that is under the same data rights restrictions as noncommercial data, in a shared database system.

The specification and enumeration of copyright licenses will provide significant protection for data developers in CALS. There is confusion on all sides as to the protection afforded by copyrights and data rights licenses. The separation of these rights categories will provide clarification and an increased willingness for companies to put protected data on a CDRL and a shared database. Therefore, the number of data developing companies attracted to CALS should increase. Because of this additional protection, the level of competition will undoubtedly rise as well.

The recommendation of the Committee to allow the possible use of prime contractors as data repositories doesn't make any sense for CALS. There is an acknowledged lack of information concerning implementation costs, the subsequent effect on competition, subcontractor data rights, and general inefficiencies that would be the result of a



decentralized approach such as this. It is believed that prime contractors would shrink away from CALS if they were called upon to manage a database that could be of tremendous volume. They would be required to have large amounts of hardware, software, and personnel to accomplish this feat. Subcontractors will hesitate to put their data on the CALS database because of prime contractor control. If the prime contractor is controlling and managing the database, how will the subcontractor maintain access security?

There is one area that was proposed by the Committee that is seen as a possible deterrent to commercial integration, competition and CALS: the establishment of a fixed set of Government purpose rights.

This proposal seems to weaken the competitive attraction of companies to the Government procurement arena. Anytime the Government dictates data rights that are different from those found in the normal commercial market, there will be decreases seen in the numbers in the Government market. The five-year restriction period will probably assist the non-developers in conducting business in direct foreign sales and spare parts since the Government receives unlimited rights at the end of the restriction period. However, the non-developer's business is not the focal point of CALS while major weapon system procurement is. This restriction time will tend to discourage commercialization and entry into the Government marketplace for data developing companies.

## **H. SUMMARY**

In the preceding Chapter, there have been many concepts and ideas presented.

By analyzing the origin and restrictions of technical data rights, several problem areas were found. Too many organizations were found to segregate their contracting and

technical personnel. This results in unexplained and often times excessive data requirements that cannot be explained. Because of this division, contracting people usually do not ask questions as to whether the technical data are necessary in the procurement. Many of the contracting personnel are unfamiliar with the different data rights categories and are not sufficiently trained in the differences between data access and data ownership. Historically, the Government has attempted to overly restrict technical data rights and has driven away commercial integration. While there are indications that the Government has reversed this attitude, one must be wary of an over-correction that could result in a detrimental situation to the Government.

The marketplace for CALS can be an attractive one for industry, but not at this time. Industry has not been apprised and convinced of the benefits that CALS offers. There has not been a CALS advocate to present CALS attributes to members of the marketplace and keep CALS in the forefront of the industry mindset. There has not been an adequate addressing of incentives that would stimulate industry and Government enthusiasm. These needed incentives include: providing a long-term cost-benefit analysis of the CALS initiative, establishing a set of technical data standards that deal with compatible languages, developing a standard contract language that removes technical data rights confusion, and data access and delivery methods. Industry is fearful that the desired security and control over their technical data will be sacrificed in a CALS environment.

There are several protective actions that are regularly being sought by industry to protect technical data and intellectual property. Analysis indicates that there is confusion as to the protective coverage offered by these actions: copyrights, patents, and trade secrets. This

confusion is aggravated by unclear wording in the FAR and DFARS as to what coverage is associated with technical data rights and under what particular circumstances they apply. There are pending regulation changes proposed by a Government-Industry Technical Data Advisory Committee that seek to clarify this and other areas of confusion. Other implications of these changes include increased data and intellectual property ownership and rights for the data developing companies, separate treatment of commercial and noncommercial items, and the establishment of a fixed rights restriction category of GPLR. The implications for non-data developing companies are that they will not have the degree of access that they had when the Government often claimed unlimited rights. This will impact their ability to conduct business.

Generally, CALS has been initiated without a viable strategy for attaining success. From its inception, CALS has been presented in a fragmented manner that has not attracted commercial industry as was initially hoped for. There have not been any known attempts to use existing tools such as Total Quality Management/Total Quality Leadership (TQM/TQL) to analyze the procurement process or to use CALS as an enabler of TQM/TQL change. Too often, the Government's arcane attitude and perceptions about computer assets have been major stumbling blocks that only hinder the procurement process.



## **V. CONCLUSIONS AND RECOMMENDATIONS**

### **A. CONCLUSIONS**

There are several conclusions that can be drawn from the previous discussions presented in this thesis. The best method in which to present these conclusions is in the form of answering the research questions introduced in Chapter I. Answers to the subsidiary questions will be provided first in the conclusions section. A generalized overview will be provided at the end of the conclusion section. Because of the nature of the primary research question, it will be answered in the recommendations section of this thesis.

#### **1. Subsidiary Research Questions**

The three technical data rights restriction categories: unlimited, limited, and GPLR are based primarily upon the funding source. These three categories can be negotiated for situations that are extraordinary. This ability to negotiate is one of the major keys to data rights restriction flexibility. If the data developers or data owners are adequately compensated for their data, they will surrender data ownership privileges. In order for the Government to effectively negotiate for technical data rights, they must be able to effectively identify the technical data that are actually required, not be excessive in their desires for data access or data ownership. The Government must also be acutely aware of the cost of the technical data they are negotiating for and the scope of the data application.

The origins of the data restrictions are not understood or controlled by the Government and industry. These origins are found in four different areas: detailed assessment of technical data (including a thorough cost-benefit analysis) during the early phases of weapon system acquisition; the relationship between technical experts, who develop the data

requirements, and contracting personnel, who apply these requirements to a procurement action; and proper construction of the Government's solicitation.

There is not sufficient training between the technical experts who derive the data requirements and the contracting personnel who apply the data requirements to a specific procurement action. Training will benefit the abilities of both parties to be able to minimize conflicts and confusion before they have a chance to start.

Regular, detailed assessments of technical data requirements early in the acquisition of weapon systems do not occur. These assessments would require more foresight on the parts of the procurement officials than ever before, but would save the Government significant amounts of money on additional data requirements identified in the later production phase of weapon systems acquisitions.

If the regulation proposals dealing with data rights restrictions are instituted as previously discussed, CALS will be impacted through the virtual monopoly of ownership held by the data developers, who are usually large companies. The non-data developers--the small businesses--will be put into a situation of paying for data they might otherwise have received gratis from the Government.

The manner in which the Government and industry treats technical data and intellectual property has a profound affect on the marketplace. Industry's greatest concern with the protection of their data and property is that it often provides them with product or service differentiation needed for company survival. If this protection level is sacrificed, they are vulnerable to competition. This scenario is true for the current industrial base. Industry realizes that technical data are vital to the defense industry, but does not desire to relinquish data rights ownership unless the level of compensation is adequate.

Industry will use and support an automated shared data base system if it is shown to be more profitable than other methods. Industry is a profit-oriented entity that requires some type of metric to prove that CALS is cost effective and secure to use.

The Government needs to change both the actual ways in which they deal with automated procurement and technical data rights and the perception by industry that the Government is ill-suited to operate and manage a high-technological, complex procurement system such as CALS.  
[Ref.10]

Technical data rights are important to the Government because of competition requirements found in the FAR and DFARS, and in statutes such as CICA. The Government is also very concerned with having alternative supply sources for weapon systems. They do not want to be totally dependent upon the actions or inactions of a sole source for systems that fill national security requirements. However, the Government needs to get serious about the true direction they want to proceed in. Is the quest for alternative supply sourcing still a viable goal? Is the Government striving to reach a "fair and reasonable price" for technical data or is it searching for the lowest possible price?

Because of the value and uniqueness of technical data and intellectual property, there are several methods used to protect it. Copyrights, patents, treating data as trade secrets, and restrictive markings on the contractor's proposal are the most common protective actions found in Government-industry procurement actions. Additional data access methods such as CITIS are designed to provide data protection in a shared database/CALS environment.

Companies do use variations of the basic non-CALS safeguards when dealing within their industry. While these

protective actions are found in abundance, there are built-in limitations found in each. While the Government has historically used these limitations to their advantage, the current data user is more apt to find that the Government is much more considerate of these protective measures and tends to abide by them. The Government seems to be aware that while the call for competition still exists, there also exists the realities of a shrinking corporate resource base. This makes the Government more keen in keeping the productive, sound contractors happy. On the other hand, industry is quite aware that the Government's tendencies have changed and will continue to use all available forms of technical data and intellectual property protection.

All of these protective measures will continue to be used in the CALS environment. It is believed that additional emphasis will be placed upon protecting the technical data in a CALS scenario since the access to the data and the disclosure of the idea behind the data will be to a possibly wider audience under less direct control.

The impact of CALS upon technical data and intellectual property rights are significant. The current trends point to the Government allowing more contractor control over their own technical data and intellectual property. This new freedom of rights will result in the contractors mandating that CALS provide significant, measurable advantages over other possible procurement methods. Industry will be looking for standards in the development of digital data access, storage and delivery, security measures, and data contracting that will, in turn, maintain their data and property rights. The infrastructure of CALS will be dependent on the possible combination of technical data and intellectual property rights held by a company. Since a key element of CALS is to provide standard data exchange for DOD and industry [Ref.18, p.2], the rights



associated with the data will act as the independent variable while the data to be exchanged will be the dependent variables of this complex equation.

While the impact of technical data and intellectual property rights is significant on the current and future procurement process, the regulations, policies, and documents that address this topic are few and relatively narrow in scope. The FAR and DFARS address technical data and data rights in broad strokes but do not discuss them in the context of automated procurement actions such as CALS. DOD Directive 5000.1, DOD Instruction 5000.2, and Military Handbook 59A include discussion of digital data in procurement but are vague in their approach. The proposed regulation changes that have been presented in this thesis involve only the FAR and DFARS. No clarification or simplification has been officially proposed in CALS-specific guidelines but is severely required to assist the implementation of CALS. These documents should be revised so as to be specific and address the requirements and situations that will be encountered by the users of CALS.

The actual use of the technical data or intellectual property, and the protection afforded, needs to be of greater concern. In a CALS setting, a clarification of these protective measures would foster better feelings among the possible industry participants about the security of their information in case of an unauthorized disclosure.

In addition to these statute-supported protective methods, the CITIS concept does not provide standardization for CALS users. Contractors are currently using their own data access to ensure compatibility within their own organizations while sacrificing the wider, basic requirement for standardization within the CALS environment.

## **2. Generalized Overview**

CALS is a technological initiative that has had problems related to technical data rights and intellectual property from the beginning of the program. The overall problem stems from a lack of structure, i.e. a lack of managerial direction and guidance, a lack of cost controls, a lack of data standardization, and a lack of data assessment.

Regulations and policies provide standardization and a pathway for executing any program within DOD. The regulations and policies for CALS and technical data rights do not provide these requirements. Personnel responsibilities are unclear. Each DOD Service component is implementing CALS on its own volition because only general guidance is formally provided. There is a lack of precise contracting language, and working definitions of terms are not provided.

Most of the defense contractors are wary of exposing their technical data on a Government operated, shared data base. The lack of incentives for using CALS and the lack of a true definitive goal for and definition of CALS have slowed its implementation, and serves as further indications to industry that the program may be in trouble. Contractors know that they can sometimes ignore a program that appears to be in trouble and wait for the Government to develop another program that will receive the needed support. CALS needs this additional support to prevent being ignored and slowly phased out.

## **B. RECOMMENDATIONS**

### **1. Research Questions**

To properly answer the primary research question, the aspects discussed in the Data Analysis Chapter, (Chapter III), must be addressed. Therefore, the recommendations in

this section will be presented in the order in which they were introduced in Chapter III, and together they will provide the answer required for the primary research question.

In order to properly construct data restrictions, the originating sources must be correctly utilized and controlled. To do this, the first recommendation would be to implement detailed assessments of technical data in the early phases of weapon system acquisition. This assessment needs to be conducted during the engineering and manufacturing phase (phase II of the weapon system acquisition process). This assessment should also include a thorough cost analysis of the data requirements. The Government should make more use of the "Rough Order of Magnitude" (ROM) which allows the "standard price" concept to be used as a budgetary input figure but doesn't require all of the paperwork required by the FAR. [Ref.6] The second recommendation involves the training of technical experts and contracting personnel. This training should involve information not only on technical data and intellectual property rights in the context of their own jobs, but should also include information on the other job area.

Emphasis on the correct use of the Government's solicitation should be made. Instead of using the solicitation as a "wish list," it should be used to acquire access or ownership to the minimum essential technical data required for that particular procurement action. Again, training the personnel providing inputs to the solicitation will provide the quickest, most effective results.

To follow up on the recommendation stated above, the establishment of standard contracting language for CALS is recommended. Too often, the legal language entraps the contracting officer into a less-than-ideal contracting

situation for procurements involving digital data.

The importance of technical data in both the commercial and Government marketplace has been well-documented. A recommendation is for the CALS-Industry Steering Group and the Government-Industry Technical Data Advisory Committee to join forces with industry representatives. They should concentrate on having the Government provide the same type of technical data protection as is offered in commercial business. If this is not done, DOD and other Government agencies will suffer a loss of a significant portion of their much-needed industrial base resource.

It is recommended that the impetus for the acquisition of technical data by the Government be reexamined. The days of buying technical data because no one wants to be accused of not doing their job, or buying technical data on a "cookie cutter" approach is over. While it is recognized that there are competition requirements to meet, competition is not appropriate for every procurement. Alternative sourcing should be examined. It isn't too often that the Government has to go out for entirely new supply sources. Alternative sourcing should be used only for extreme emergencies such as war. To accomplish this recommendation, CICA should be revised to account for additional freedom in determining the need for competition by providing guiding principles instead of rigid procedures.

Cost is another area that needs improvement when analyzing the impetus for technical data procurement by the Government. The cost drivers involved in technical data need to be properly identified and accounted for. Once this has been accomplished, a proper long-term cost-benefit analysis should be conducted. How the data are priced per contract should be a focal point. The pricing of technical data needs to be done for every procurement, not just for contracts over \$100,000. Procuring Contracting Officers and

Program Managers need to be fully aware of the cost of the technical data at all times. For CALS, technical data access costs need to be accumulated by each contractor to avoid double-charging the Government for the same data.

To allow proper monitoring of CALS costs and benefits, CALS should receive a separate budget line-item. This would greatly help the Government and industry track CALS costs and system progress.

The impact of CALS upon technical data and intellectual property rights will only be beneficial and meaningful if CALS itself is presented to industry as a beneficial and meaningful system. Full Government support must be given to CALS in order for CALS to be successful. This support can come from initiating a specific definition of CALS, specific goals, specific incentives, specific standards to follow, and specific guidelines.

Once these steps have been taken, the impact of CALS upon technical data and intellectual property rights can be controlled by the Government, providing standardized methods for the data and property along with standard methods of dealing with the inevitable issues and disputes that will arise. Among the possible areas in which questions and arguments may arise are recompetition of products that were once sole source and are now being procured under a competitive scenario and existing programs that are now seeking to implement CALS.

One must realize that CALS treatment of technical data and intellectual property rights must be dealt with uniformly and in concert with the treatment these areas receive in the commercial marketplace. If they are not, industry will not be drawn into the CALS arena. Therefore, a recommendation is made to align CALS technical data and intellectual property treatment with that found in industry.

The one aspect of CALS that appears to impact data

rights more than others is data access security. CITIS needs to be standardized in its implementation, JCALS needs to be implemented to allow it to be connected to CALS installations which will provide the single point of entry to the data base, and security methods need to be standardized and used by all participants. Until access security can be guaranteed and demonstrated to CALS users, CALS will not be successful.

The proposed regulation changes need to be reexamined to determine the impact they will have on small, non-data developing firms. It is believed that the proposals favor the larger, data developing companies that have the resources to fund and provide the data required by the Government. It is suspected that this will affect the composition of players in the CALS system, and the socioeconomic demands that have been placed on the Government in the area of small business incentives.

The regulation change proposals should be expanded to include revisions to DODD 5000.1, DODI 5000.2, and MIL-HDBK 59A. In constructing these proposals, representatives from the Government, including those at the user level, and industry should be assigned to work in concert with the goal of providing new guidance. This guidance must be crystallized enough to enable those at the middle management level to know how to best implement these guidelines in order for the users to make CALS work in the most efficient manner possible.

As far as the specific regulation proposals, funding should be used for the technical data rights allocation basis. The assumption of risk that is undertaken by a company to develop technical data or intellectual property is in need of compensation. It is believed that the best compensation in this situation is the awarding of ownership.

The development of new technology is something that the

Government cannot afford to discourage. Funding should be the determining factor in this situation. Therefore, it is recommended that the "required for performance" criterion be eliminated. Included in the guidelines for determining when data are actually "developed", it is recommended that the Government begin using computer simulation tools such as CAD. Decreases in cost and time spent on data development can be used to benefit both the Government and industry, and should be done so at the earliest possible time.

The definitions of expenses and indirect costs should be modified. This will not only encourage new technological advances from large, data developer companies but will encourage the smaller companies to develop their own data.

The treatment of commercial items should be handled separately in the FAR and DFARS. It is cost effective and good business sense for the Government to encourage the expanded use of commercial items in the Government marketplace. If the separation of commercial items does not materialize, the Government will lose some of the incentive for the integration of this area into Government business.

The recommendation for data copyrights, patents, and trade secrets would be to clarify and simplify the language associated with these areas. In addition to including language that addresses copyright licensing rights, protection of the idea needs to be addressed and emphasized.

Currently, the Government does not have the capability to store contractor technical data [Ref.4, p.50]. However, the alternative method of having the prime contractors act as data repositories cannot work. It is recommended that this area receive additional investigation as to whether a centralized repository can be instituted efficiently and effectively.

## **2. Summary**

The Government needs to change their attitudes about automated procurement and the perceptions that industry has about the Government. While the Government has taken strides to improve the way in which they abide by the protective methods used by companies in protecting their technical data, they have not done enough. Industry and the Government must feel better about using CALS in a general sense before any improvements in technical data and intellectual property rights will have the desired effect. Among those items: providing a clear definition of CALS and its goals and a strategy for achieving those goals; definitive, clear guidelines, regulations and policies; meaningful metrics for CALS performance; a complete cost-benefit analysis of CALS and its peripheral subsystems; a feedback system for involving industry in the implementation and use of CALS; and standardized methods for digitizing data, for writing contracts, and system implementation is recommended. Additionally, the Government should use existing initiatives such as TQM/TQL to improve the procurement process and to use CALS as a method in which to allow this change.

### **C. RECOMMENDATIONS FOR FURTHER RESEARCH**

Once the cost elements of technical data and intellectual data rights have been established, a thorough cost-benefit analysis of CALS and its associated systems would be most beneficial. Determinations of what environments and applications would be most compatible and those not compatible with CALS would greatly assist both the Government's and industry's implementation plans.

A second area that would be worthy of further examination would be how CALS and automated procurement treatment of technical data and intellectual property rights



would be held in an international climate. The research should use existing or proposed U.S. policies as a template and determine the changes that would be necessary.



## APPENDIX A. GLOSSARY OF TERMS

ACO	Administrative Contracting Officer
ASD (P&L)	Assistant Secretary of Defense (Procurement and Logistics)
ASPM	Armed Services Pricing Manual
CAD	Computer-aided Design
CALS	Continuous Acquisition and Life- Cycle Support
CALSIP	Continuous Acquisition and Life- Cycle Implementation Plan
CAS	Cost Accounting Standards
CDRL	Contract Data Requirements List
CICA	Competition In Contracting Act
CITIS	Contractor Integrated Technical Information System
CLIN	Contract Line-Item Number
DAB	Defense Acquisition Board
DARC	Defense Acquisition Regulatory Council
DCAA	Defense Contract Audit Agency
DLA	Defense Logistics Agency
DFARS	Defense Federal Acquisition Regulation Supplement
DLSIE	Defense Logistics Studies Information Exchange
DOD	Department Of Defense
DODD	Department Of Defense Directive
DODI	Department Of Defense Instruction
DTIC	Defense Technical Information Center
DSREDS	Digital Storage and Retrieval Engineering Data System
FAR	Federal Acquisition Regulation

FCO	Final Cost Objective
GDDM	Global Distributed Data Management
GPLR	Government Purpose License Rights
ILS	Integrated Logistics Support
IR&D	Independent Research and Development
IWSDB	Integrated Weapon System Database
JCALs	Joint Continuous Acquisition and Life-Cycle Support
MDA	Milestone Decision Authority
MIL-HDBK	Military Handbook
MIL-STD	Military Standard
OASD (P&L)	Office of the Assistant Secretary of Defense (Procurement and Logistics)
OEM	Original Equipment Manufacturer
OMB	Office of Management and Budget
OUSD (A&T)/CALs	Office of the Under Secretary of Defense (Acquisition and Technology)/Continuous Acquisition and Life-Cycle Support
PCO	Procuring Contracting Officer
PMR	Procurement Management Review
POC	Percentage Of Contribution
RFP	Request For Proposal
ROM	Rough Order of Magnitude
SOW	Statement Of Work
TQM/TQL	Total Quality Management/Total Quality Leadership
USD (A&T)	Under Secretary of Defense (Acquisition and Technology)

## **APPENDIX B. PRELIMINARY SURVEY (CONTRACTOR)**

1. Do any of your company's Government contracts involve a shared database configuration? If so, what percentage of the contracts do so?
2. Are any of the shared database applications described in question #1 a CALS (Continuous Acquisition Life Cycle) system?
3. Have technical data or intellectual property rights been a consideration when conducting the automated procurements?
4. How did you first learn of the Government's need for technical data for the procurement?
5. Do you use patents, copyrights, or other protective measures to protect your company's technical data or intellectual property? If so, which is the most effective and why is it the most effective?
6. What has motivated you/your company to use CALS/a shared database system? If you don't use either, why not?
7. What Government regulations are used in dealing with technical data/intellectual property rights issues? What would you do to improve them?
8. Why is technical data/intellectual property important to your organization?



## **APPENDIX C. PRELIMINARY SURVEY (GOVERNMENT)**

1. Who is responsible for determining the amount and types of technical data/intellectual property required for a particular procurement?
2. What served as the impetus for the technical data restrictions?
3. Which technical data rights restrictions cause the most problems in contract negotiations?
4. If the Government desires more technical data rights than the contractor initially offers, how is it handled?
5. Why is technical data/intellectual property important to the Government?
6. What guidelines and regulations are used when dealing with technical data and intellectual property rights? What should be done to improve these sources?
7. What actions are followed when a contractor's proposal includes restrictive markings that are deemed adequate? If they're deemed inadequate?





#### APPENDIX D. FINAL SURVEY (CONTRACTOR)

1. What is your experience in using a shared database/the Continuous Acquisition Life Cycle (CALS) System?
2. What is the application of the shared database or CALS?
3. How did you first become aware of the Government's restrictions/requirements pertaining to technical data for a procurement?
4. Describe the differences found in the treatment of technical data/intellectual property in the commercial marketplace versus the Government marketplace.
5. What measures are used in your company to protect technical data/intellectual property?
6. In your opinion, does the Government seek the correct restrictions on technical data? Does it seek the correct amount of technical data/intellectual property?
7. What motivated your company to use/not use CALS?
8. What are the differences between the methods in which commercial companies handle technical data/intellectual property rights issues and the methods used by the Government? How can these differences be minimized?
9. Describe the impact your CALS system/shared database system has had on technical data/intellectual property rights?

10. Describe the methods used by your company to price technical data/intellectual property.

11. If your company uses CALS, was a Contractor Integrated Technical Information Service (CITIS) used? A Government Concepts of Operations (GCO) provided? A CALS Implementation Plan (CALSIP) used by your company? Were there problems with these?

12. Is the shared database/CALS satisfying your procurement needs?

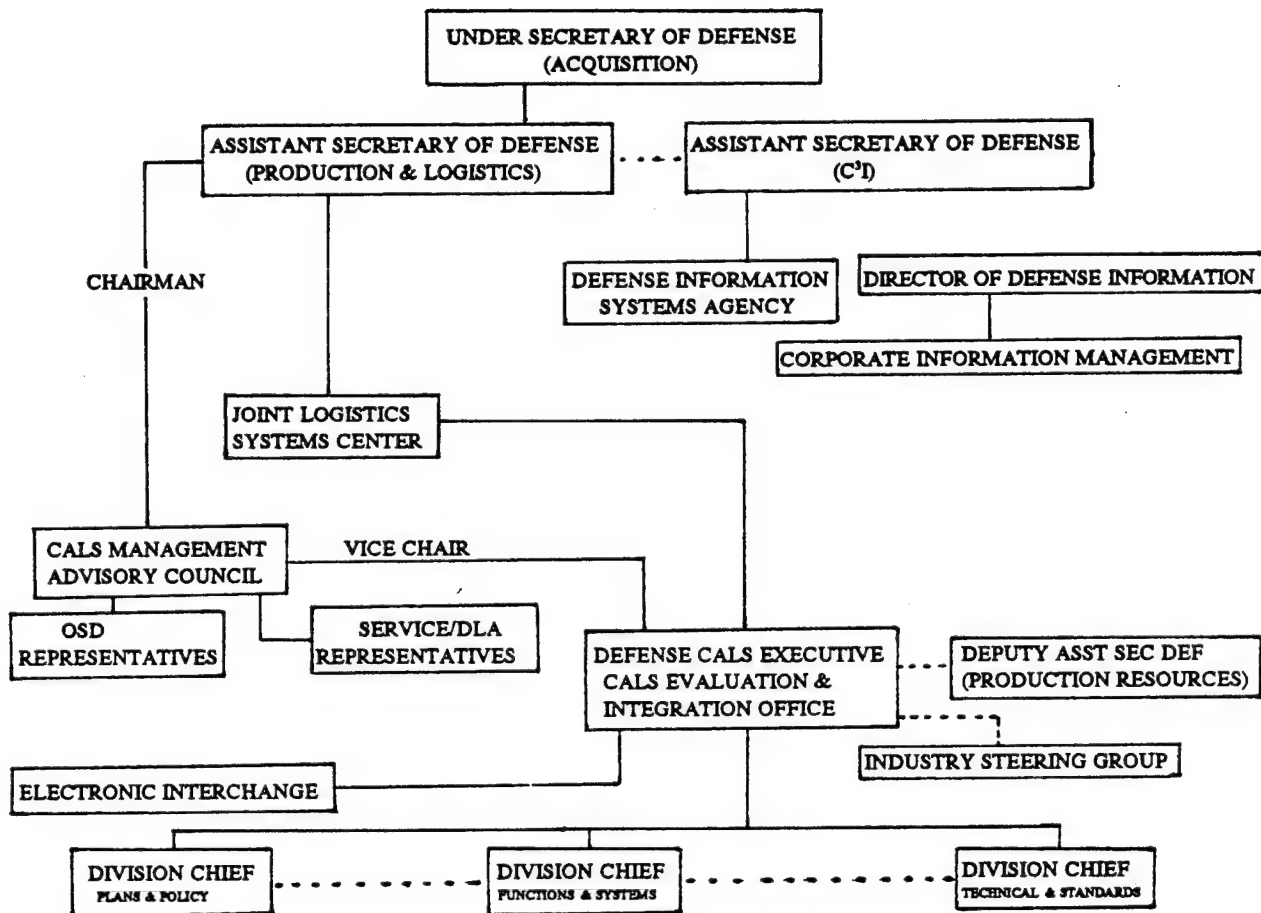
## APPENDIX E. FINAL SURVEY (GOVERNMENT)

1. How are the technical data/intellectual property rights restrictions developed?
2. Who decides the amount and restrictions of technical data/intellectual property that will be sought for the procurement?
3. What provides the impetus for technical data/intellectual property acquisition and restrictions?
4. Which technical data rights restrictions cause the most problems during contract negotiations? The least problems?
5. What is your criteria for nonacceptance of the contractor's restrictive markings on the technical data?
6. When are the costs of technical data/intellectual property considered? Are technical data priced for all procurements?
7. What alternatives to acquiring the technical data/intellectual property are used?
8. What percentage of the contracts in your activity are handled via CALS or a shared database system?
9. What are the advantages of CALS or a shared database? The disadvantages?
10. Is there a difference of opinion between the Government and industry concerning technical data/intellectual property rights? What are they?

11. How can the differences described in question #10 be improved?

12. What regulations or guidelines are used when dealing with technical data/intellectual property issues? How can these sources be improved?

## APPENDIX F. MANAGEMENT ORGANIZATION OF CALS



Source: Government-Industry Technical Data Advisory Committee. Report to the Secretary of Defense, April 6, 1994.



## LIST OF REFERENCES

1. Naval Forces CALS Architecture and Environment, Revision 2, September 1, 1992.
2. CALS Architecture Study, version 1.0, vol. I & II, The Joint CALS Management Office, June 30, 1991.
3. Department of Defense Inspector General Report, Management of Technical Data, June 8, 1994.
4. Government-Industry Technical Data Advisory Committee. Report to the Secretary of Defense, April 6, 1994.
5. Department of Defense. Department of Defense Federal Acquisition Regulation Supplement. U.S. Government Publishing Office, Washington, D.C., April 1984.
6. Hadfield, W., ESL Corporation, price analyst, telephone interview, February 18, 1994.
7. Warmington, J., CDR, USN, Naval Postgraduate School faculty, personal interview, August 23, 1994.
8. Hawker, R., ARGO Systems, Inc., pricing team member, telephone interview, February 17, 1994.
9. Stickman, J., CALS Industry Steering Group, TRW Corporation, telephone interview, January 12, 1994.
10. Rainey, J., FMC/BMY, Bradley contracts manager, personal interview, July 25, 1994.

11. Stewart, W.G., and Clark, P.W., Computer-aided Acquisition and Logistics Support: Rights In Technical Data, Department of Defense, Washington, D.C., February 1992.

12. Department of Defense. Department of Defense Instruction 5000.2, "Defense Acquisition Management Policies and Procedures." Department of Defense, Washington, D.C., February 23, 1991.

13. Kidwell, R., CALS Industry Steering Group, Management Technologies, Inc., telephone interview, February 4, 1994.

14. Langkamp, D., Office of the Secretary of Defense CALS Executive, telephone interview, February 9, 1994.

15. Maizel, D., Trade Secrets and Technical Data Rights in Government Contracts, Military Law Review, vol. 114, Fall 1986.

16. Heisterberg, R., Dr., Loral Space and Range Systems, CALS/EDI Supervisor, telephone interview, August 17, 1994.

17. Department of Defense. Contractor Integrated Technical Information Service (CITIS), Military Standard, (MIL-STD-974), August 20, 1993.

18. Department of Defense. Continuous Acquisition and Life-Cycle Support (CALS) Implementation Guide, Military Handbook, (MIL-HDBK-59B), December 28, 1993.

19. Donatuti, R., Deputy Director for Acquisition, Office of the Under Secretary of Defense for Acquisition, telephone interview, September 21, 1994.



20. Elliot, E., RADM, US Navy, CALS: What Should DOD Be Doing?, CALS Journal, Winter 1993.
21. Sherman, S., Government Procurement Procedures, p. 179, Woodcrafters, 1991.
22. Farmer, K., Defense Contract Management Area Operations Office- San Francisco, operations analyst, personal interview, July 25, 1994.
23. Department of Defense. U.S. Department of Defense, Armed Services Pricing Manual, U.S. Government Publishing Office, Washington, D.C., 1986.
24. Brookins, S., Office of the Secretary of Defense CALS Executive, telephone interview, February 17, 1994.
25. Lemire, J., Cost Estimating Methods Utilized by the Defense Aerospace Industry in the Production of Technical Data, M.S. thesis, Naval Postgraduate School, Monterey, California, June 1985.



# INITIAL DISTRIBUTION LIST

	No. Copies
1. Defense Technical Information Center Cameron Station Alexandria, Virginia 22304-6145	2
2. Library, Code 52 Naval Postgraduate School Monterey, California 93943-5101	2
3. Professor David V. Lamm Systems Management Dept. (Code SM/Lt) Naval Postgraduate School Monterey, California 93943-5101	5
4. Professor Mark W. Stone Systems Management Dept. (Code SM/St) Naval Postgraduate School Monterey, California 93943-5101	1
5. CDR Rebecca J. Adams Systems Management Dept. (Code SM/Ad) Naval Postgraduate School Monterey, California 93943-5101	1